February 1978 Number 402-Part 1

P-A STACKS
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No402,pt1
MAR 1978

Solar-Geophysical Data prompt reports

Data for January 1978–December 1977

Explanation of Data Reports Issued as Number 402 (Supplement) February 1978

NEW DATA PAGE 17
ERRATA PAGE 105

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Solar - Geophysical Data

NO. 402 FEBRUARY 1978

Part I (Prompt Reports)

DATA FOR
JANUARY 1978
DECEMBER 1977

NATIONAL GEOPHYSICAL AND SOLAR - TERRESTRIAL DATA CENTER
BOULDER, COLORADO

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No. 402

Issued in two parts

Helen E. Coffey, Editor

J. Virginia Lincoln, Director
Solar-Terrestrial Data Services Division

CONTENTS

PAGE

Part I (Prompt Reports)

Index for 1977 and 1978 2

Data for January 1978 3-34

Data for December 1977 35-133

Part II (Comprehensive Reports)

Index for 1977 and 1978 2

Data for August 1977 3-28

Data for July 1977 29-39

Miscellaneous Data 41-68

Solar Radio Waves
Spectral Observations Weissenau, November 1977

Cosmic Rays
Chart of Variations, Daily Values
Calgary, Sulphur Mt. -- October 1977
Alert, Deep River -- November 1977

Solar X-ray Radiation
December 1976 - June 1977

INDEX FOR 1977 AND 1978 DATA PUBLISHED IN "SOLAR-GEOPHYSICAL DATA"

		1977 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	1978 Jan
A.	SOLAR AND INTERPLANETARY PHENOMENA	391A 34	392A 28	393A 34	394A 32	395A 36	396A 35	397A 32	398A [illegible]	399A 34	400A 30	401A [illegible]	402A 38	
A.1	Sunspot Drawings	390A 7	391A 7	392A 7	393A 7	394A 7	395A 7	396A 7	397A 7	398A 7	399A 7	400A 7	401A 7	402A 9
A.2a	Zurich Provisional Relative Sunspot Numbers Rz													
A.2b	Zurich Final Sunspot Numbers Rz	390A 7	391A 7	392A 7	393A 7	394A 7	395A 7	396A 7	397A 7	398A 7	399A 7	400A 7	401A 7	402A 9
A.2c	American Relative Sunspot Numbers RA'	391A 34	392A 28	393A 34	394A 32	395A 36	396A 34	397A 32	398A 36	399A 34	400A 30	401A 36	402A 38	
A.3a	Mt. Wilson Magnetograms	391A 96	392A 84	393A 96	394A 92	395A 98	396A 94	397A 94	398A [illegible]	399A 94	400A 92	401A [illegible]	402A100	
A.3b	Mt. Wilson Magnetic Characteristics of Sunspots	391A 34	392A 28	393A 34	394A 32	395A 36	396A 34	397A 32	398A 36	399A 34	400A 30	401A 36	402A 38	
A.3c	Kitt Peak Magnetograms	390A 21	391A 23	392A 21	393A 29	394A 27	395A 29	396A 29	397A 25	398A 29	399A 29	400A 24	401A 31	
A.3d	Mean Solar Magnetic Field (Stanford)	391A 34	392A 28	393A 34	394A 32	395A 36	396A 35	397A 32	398A 36	399A 34	400A 30	401A 36	402A 38	
A.4	H-alpha Filtergrams	391A 34	392A 28	393A 34	394A 32	395A 36	396A 35	397A 32	398A 36	399A 34	400A 30	401A 36	402A 38	
A.5	Calcium Plage Drawings - McMath (or Catania)	391A 96	392A 84	393A 96	394A 92	395A 98	396A 94	397A 94	398A [illegible]	399A 94	400A 92	401A [illegible]	402A100	
A.5a	Calcium Plage (McMath) and Sunspot Regions	391A101	392A 88	393A100	394A 96	395A104	396A 99	397A101	398A105	399A 99	400A 99	401A100	402A105	
A.5b	McMath Daily Calcium Plage Indices	391A 32	392A 26	393A 32	394A 30	395A 34	396A 32	397A 30	398A [illegible]	399A 32	400A 28	401A 35	402A 36	
A.6	H-alpha Synoptic Charts	395B 4	396B 4	397B 4	398B 4	399B 4	400B 4	401B 4	402B 4					
A.6b	Synoptic Chart and Active Regions (Paris)	390A 18	391A 22	392A 18	---	394A 21	---	396A 20	397A [illegible]	398A 24	399A 24	400A 21	401A 28	402A 29
A.7f	Helium D3 Chromosphere (Big Bear)	390A 19	391A 23	392A 19	393A 23	394A 22	395A 24	396A 22	397A 20	398A 22	399A 23	400A 20	401A 27	402A 28
A.7g	Helium Synoptic Maps (KPNO)	391A 34	392A 28	393A 34	395B 36	395A 36	396A 34	397A 32	398A 36	399A 34	400A 30	401A 36	402A 38	
A.7h	Coronal Line Emission (Sac Peak)	390A 7	391A 7	392A 7	393A 7	394A 7	395A 7	396A 7	397A 7	398A 7	399A 7	400A 7	401A 7	402A 9
A.8aa	2800 MHz - Daily Values of Solar Flux (ARO-Ottawa)	390A 7	391A 7	392A 7	393A 7	394A 7	395A 7	396A 7	397A 7	398A 7	399A 7	400A 7	401A 7	402A 9
A.8ac	2800 MHz - Daily Values of Adj. Solar Flux (ARO-Ottawa)	390A 7	391A 7	392A 7	393A 7	394A 7	395A 7	396A 7	397A 7	398A 7	399A 7	400A 7	401A 7	402A 9
A.8g	Daily Values of Adjusted Solar Flux (AFGL)	391A 34	392A 28	393A 34	394A 32	395A 36	396A 35	397A 32	398A 36	400B 57	400A 30	401A 36	402A 38	
A.9cb	8.6 mm Radio Maps of the Sun (NOSC - La Posta)	391A 34	392A 28	393A 34	394A 32	395A 36	396A 35	397A 32	398A 36	400B 52	400A 30	401A 36	402A 38	
A.9d	2 cm Radio Maps of the Sun (NOSC - La Posta)	390A 12	391A 13	392A 12	393A 13	394A 12	395A 14	396A 12	397A 13	398A 14	399A 14	400A 12	401A 15	402A 16
A.10a	169 MHz - Interferometric Observations (Nancay)	391B 43	391A 15	393B 35	393A 15	394A 14	395A 16	396A 14	397A 15	398A 16	399A 16	400A 14	401A 17	402A 19
A.10c	21 cm East-West Solar Scans (Fleurs)	391B 44	391A 16	393B 36	393A 16	394A 15	395A 17	396A 15	397A 16	398A 17	399A 17	400A 15	401A 18	402A 20
A.10d	43 cm East-West Solar Scans (Fleurs)	390A 13	391A 14	392A 13	393A 14	394A 13	395A 15	396A 13	397A 14	398A 15	399A 15	400A 13	401A 16	402A 18
A.10e	10.7 cm East-West Solar Scans (Ottawa-ARO)													402A 17
A.10f	3 cm East-West Solar Scans (Toyokawa)	390A 15	391A 19	392A 15	393A 20	394A 18	395A 21	396A 17	---	398A 25	399A 20	400A 17	401A 22	402A 24
A.11g	Solar X-ray (SMS/GOES)	391A 34	392A 28	393A 34	394A 32	395A 36	396A 34	397A 32	398A 36	399A 34	400A 30	401A [illegible]	402A 38	
A.11h	Solar X-ray (OSO-8, 1975-057A)	402B 51	402B 54	402B 57	402B 60	402B 63	402B 66							
A.11i	Solar X-ray (Columbia U.)	---	391A 25	---	393A 24	394A 23	395A 26	396A 24	397A 23	---	399A 26	---	---	402A 30
A.12ba	Cosmic Ray Protons (Pioneers 6 & 7)	---	391A 27	---	393A 26	394A 24	395A 27	396A 25	---	---	399A 27	---	---	402A 31
A.12bb	Cosmic Ray Protons (Pioneers 8 & 9)	395B 17	396B 20	397B 15	398B 22	399B 18	400B 34	401B 20	402B [illegible]					
A.12e	Energetic Solar Particles (IMP H & J)	---	391A 25	---	393A 24	394A 23	395A 26	396A 24	397A 23	---	399A 26	---	---	402A 30
A.13a	Solar Wind (Pioneers 6 & 7)	---	391A 27	---	393A 26	394A 24	395A 27	396A 25	---	---	399A 27	---	---	402A 31
A.13ab	Solar Wind (Pioneers 8 & 9)	390A 24	391A 24	392A 23	393A 27	394A 25	395A 31	396A 27	397A 27	398A 27	399A 25	400A 25	401A 29	402A 34
A.13d	Solar Wind from IPS Measurements	395B 17	396B 19	397B 15	398B 21	399B 17	400B 33	401B 19	402B 23					
A.13e	Solar Plasma (IMP H & J)	---	---	---	---	---	395A 27	396A 25	---	---	---	---	---	---
A.17	Interplanetary Magnetic Field (Pioneer 8)	---	---	---	---	---	395A 27	396A 25	---	---	---	---	---	402A 31
A.17	Interplanetary Magnetic Field (Pioneer 9)	390A 20	391A 28	392A 20	393A 28	394A 26	---	396A 28	397A 24	398A 28	400A 22	400A 22	401A 30	402A 32
A.17c	Inferred IP Magnetic Field	---	---	---	---	---	395A 27	396A 25	---	---	399A 27	---	---	---
A.18	Interplanetary Electric Field (Pioneer 8)	---	391A 27	---	393A 28	394A 24	---	396A 26	---	---	---	---	---	402A 31
A.18	Interplanetary Electric Field (Pioneer 9)													
B.	IONOSPHERIC (AND RADIO WAVE PROPAGATION) PHENOMENA	391A118	392A104	393A122	394A118	395A122	396A118	397A120	398A124	399A128	400A120	401A116	402A132	
B.52	Graphs of Transmission Frequency Range	391A120	392A103	393A121	394A120	395A124	396A120	397A122	398A126	399A127	400A122	401A118	402A131	
B.53	Quality Figures Based on Frequency Ranges													
C.	FLARE-ASSOCIATED EVENTS	390A 10	391A 11	392A 10	393A 10	394A 10	395A 10	396A 10	397A 10	398A 10	399A 10	400A 10	401A 10	402A 12
C.1a	Optical Observations Flares	395B 8	396B 8	397B 8	398B 8	399B 8	400B 8	401B 8	402B 8					
C.1ba	Optical Observations Flares (Standardized Data)	390A 11	391A 12	392A 11	393A 12	394A 11	395A 13	396A 11	397A 12	398A 13	399A 13	400A 11	401A 14	402A 15
C.1d	Flare Patrol Observations	395B 13	396B 13	397B 11	398B 14	399B 13	400B 19	401B 15	402B 17					
C.1d	Flare Patrol Observations	395B 12	396B 12	397B 10	398B 13	399B 12	400B 18	401B 14	402B 16					
C.1e	Flare Indices (by day)	396B 35	397B 31	398B 41	399B 33	400B 49	401B 35	402B 39						
C.1f	Flare Indices (by Region)	395B 14	396B 14	397B 12	398B 15	399B 14	400B 20	401B 16	402B 18					
C.3	Solar Radio Waves - Outstanding Occurrences	390A 14	391A 17	392A 14	393A 17	394A 16	395A 18	396A 16	397A 17	398A 18	399A 18	400A 16	401A 19	402A 21
	Solar Radio Waves - Fixed Frequencies - Selected	393B 40	393B 41	393A108	394A105	396B 41	398B 44	398B 46	399B 36	399A113	401B 44			
C.3t	43.25, 80 and 160 MHz Selected Bursts (Culgoora)	391A103	392A 90	393A102	394A 98	395A106	396A102	397A103	398A107	399A102	400A101	401A102	402A108	
C.4a	Solar Radio Spectral Obs. (Fort Davis)	391A103	393B 37	393A102	394A 98	396B 38	397B 34	397A103	400B 62	399A102	401B 38			
C.4d	Solar Radio Spectral Obs. (Culgoora)	391A103	392A 90	393A102	394A 98	395A106	397B 34	397A103	398A107	399A102	400A101	402B 42	402A108	
C.4e	Solar Radio Spectral Obs. (Weissenau)	391A103	392A 90	393A102	394A 98	395A106	396A102	397A103	398A107	399A102	400A101	401A102	402A108	
C.4f	Solar Radio Spectral Obs. (Sagamore Hill)	391A103	392A 90	393A102	394A 98	395A106	396A102	397A103	398A107	399A102	400A101	401A102	402A108	
C.4h	Solar Radio Spectral Obs. (Dwingeloo)	391A103	392A 90	393A102	394A 98	395A106	396A102	397A103	398A107	399A102	400A101	401A102	402A108	
C.4i	Solar Radio Spectral Obs. (Durnten)	391A102	392A 90	393A102	394A 98	395A106	396A102	397A103		399A102	400A101	401A102	402A108	
C.4j	Solar Radio Spectral Obs. (Manila)	390A 17	391A 21	392A 17	393A 22	394A 20	395A 21	396A 17	397A 22	399B 37	399A 22	400A 19	401A 24	402A 26
C.5e	Solar X-ray (SMS/GOES)	402B 51	402B 54	402B 57	402B 60	402B 63	402B 66							
C.5f	Solar X-ray (Columbia U.)	391A102	392A 89	393A101	394A 97	395A105	396A100	397A102	398A106	399A100	400A100	401A101	402A106	
C.6	Sudden Ionospheric Disturbances													
D.	GEOMAGNETIC AND MAGNETOSPHERIC PHENOMENA	391A114	392A 97	393A114	394A111	395A115	397B 39	397A114	398A117	399A120	400A113	401A109	402A125	
D.1a	Geomagnetic Indices Kp, Km, Ks, Km, Ap, aa, Cp	391A116	392A 99	393A116	394A113	395A117	396A113	397A116	398A119	399A122	400A115	401A111	402A127	
D.1ba	27-day Chart of Kp Indices													
D.1c	27-day Chart of C9	391A117	392A101	393A119	394A116	395A120	396A116	397A119	398A122	399A125	400A118	401A114	402A130	
D.1d	Principal Magnetic Storms					---								
D.1e	Reduced Magnetograms	392B 38	392A102	393A120	394A117	395A121	396A117	398B 47	398A123	399A126	400A119	401A115	402A129	
D.1f	Sudden Commencement and Solar Flare Effects		392A100	393A118	394A115	395A119	396A115	397A118	398A121	399A124	400A117	401A113		
D.1g	Equatorial Indices Dst													
F.	COSMIC RAYS	391A109	393B 44	393A109	394A110	395A114	396A110	397A109	398A116	399A115	400A112	402B 47	402A124	
F.1a	Cosmic Ray Neutron Counts (Deep River)	391A109	392A 96	393A109	394A110	395A114	396A110	397A109	398A116	399A115	400A112	401A108	402A124	
F.1b	Cosmic Ray Neutron Counts (Climax)	391A109	393B 44	393A109	394A110	395A114	396A110	397A109	398A116	399A115	400A112	402B 47	402A124	
F.1c	Cosmic Ray Neutron Counts (Alert)	393B 44	394B 36	394B 36	394A110	395A114	396A110	397A109	400B 70	400B 70	402B 47			
F.1f	Cosmic Ray Neutron Counts (Calgary)	393B 44	394B 36	394B 36	394A110	395A114	396A110	397A109	400B 70	---	402B 47			
F.1g	Cosmic Ray Neutron Counts (Sulphur Mountain)													
F.1h	Cosmic Ray Neutron Counts (Thule)	391A109	392A 96	393A109	394A110	395A114	396A110	397A109	398A116	399A115	400A112	401A108	402A124	
F.1i	Cosmic Ray Neutron Counts (Kiel)	391A109	392A 96	393A109	394A110	395A114	396A110	397A109	398A116	399A115	400A112	401A108	402A124	
F.1j	Cosmic Ray Neutron Counts (Tokyo)					395A114	396A110	397A109	398A116					
F.1k	Cosmic Ray Neutron Counts (Kula)													
H.	MISCELLANEOUS	390A 4	391A 5	392A 5	393A 5	394A 5	395A 4	396A 5	397A 4	398A 4	399A 4	400A 4	401A 4	402A 5
N.6U	IUWDS Alert Decisions	396B 28	397B 24	398B 34	399B 26	400B 47	401B 28	402B 32						
N.6Z	Abbreviated Calendar Record													

Notes:

"391A 34" listed under 1977 Jan means that data for January 1977 were contained in *Solar-Geophysical Data* Number 391 - Part I, beginning on page 34.

A = Part I, B = Part II.

----- = no data available.
blank = data not yet received.

JANUARY 1978 DATA

Contents

	Page
Alert Period	
IUWDS Alert Periods (Advance and Worldwide)	5-7
Daily Solar Indices	
12-Month Tables Sunspot Numbers, R_z, and 2800 MHz Flux Adjusted to 1 A.U.	8
Combined Table Sunspot Numbers and Solar Fluxes	9
Graph of Sunspot Cycles	10
Zürich Smoothed Observed and Predicted Sunspot Numbers	11
Solar Flares	
Hα Solar Flares	12-14
No-Flare-Patrol Chart	15
Solar Radio Waves	
169 MHz Solar Interferometric Chart - Nancay	16
3 cm East-West Solar Scans - Toyokawa	17
10.7 cm East-West Solar Scans - ARO, Ottawa	18
21 cm East-West Solar Scans - Fleurs	19
43 cm East-West Solar Scans - Fleurs	20
Selected Fixed-Frequency Occurrences	21-22
Selected Solar Noise Bursts	23
Solar X-ray Radiation	
SMS-2 GOES	24-27
Coronal Holes	
Helium 10830 Å Synoptic Map	28
Helium D3 Chromosphere	29
Spacecraft Observations	
Pioneer VI	30
Pioneer IX	31
Inferred IP Magnetic Field Polarities	32
Mean Solar Magnetic Field	
Stanford Mean Solar Magnetic Field Map	33
Stanford Mean Solar Magnetic Field Table (not available at time of publication)	
Solar Wind Measurements	
Scintillation Observations	34

ALERT PERIODS

INTERNATIONAL URSIGRAM AND WORLD DAYS SERVICE

JANUARY 1978

PRESTO MESSAGES (THE RAPID REPORT OF MAJOR EVENTS).

BOULDER 01/2230Z SOFLARE 1B/M3 S19E05 01/2149Z IN PROGRESS TENFLARE 600 FLUX UNITS 01/2145Z 35 MINUTES
BOULDER 03/1828Z TENFLARE 470 FLUX UNITS 03/1015Z 20 MINUTES DURATION KAKIOKA 04/0100Z MAGSTORM 03/2043Z
BOULDER 05/0000Z STRONG MAGSTORM IN PROGRESS 05/0000Z
BOULDER 07/2040Z SOFLARE S18W75 07/1905Z 68 MINUTES DURATION TENFLARE 635 UNITS 07/1905Z 60 MINUTES DURATION
TOYKAWA 07/0720Z TENFLARE 680 UNITS 07/0625Z DURATION 48 MINUTES
BOULDER 08/1600Z SOFLARE 2B/M3 S19W79 08/0210Z DURATION 64 MINUTES; SOFLARE 2B/X1 S19W80 08/0706Z DURATION 43 MINUTES
TENFLARE 750 FLUX UNITS 08/0208Z DURATION 14 MINUTES
TOYKAWA 08/0707Z TENFLARE 920 UNITS 08/0208Z DURATION 15 MINUTES WEST LIMB
TOYKAWA 08/0717Z TENFLARE 170 UNITS 08/0709Z IN PROGRESS
KAKIOKA 10/0105Z MAGSTORM 09/1625Z
KAKIOKA 31/0100Z MAGSTORM 30/0030Z

SUMMARY OF THE GEOALERT WWA MESSAGES

Message serial number	Date of issue	Date of observation	Wolf number	10 cm solar flux	A index	Active Regions: Location Lat-Long	Flares: No. Total	Flares: M	Flares: X	Outstanding events	Forecasts: Date	Forecasts: Location Lat-Long	Forecasts: Desc*	Alert Situations
001	1	31	178	124	04	N20W29	0	0	0		31	N20W29	Q	SOLALERT 01/XX MAGQUIET
						S18E17	1	0	0			S18E17	A	
						N20W17	2	0	0			N20W17	E	
						S17E42	5	1	0			S17E42	E	
002	2	1	125	133	05	N19W43	1	0	0	1B/M3 S19E05	1	N19W43	Q	SOLALERT 02/XX MAGQUIET
						S18E05	1	1	0	01/2149Z TENFLARE		S18E05	Q	
						N21W29	2	0	0	600 FLUX UNITS		N21W29	Q	
						S18E31	6	0	0	01/2145Z 75 MINUTES		S18E31	E	
						N35E42	0	0	0			N35E42	Q	
003	3	2	165	139	05	N22W53	0	0	0		2	N22W53	Q	SOLALERT MINOR 03/XX MAGQUIET
						S17W11	0	0	0			S17W11	Q	
						N21W43	5	0	0			N21W43	E	
						S17E13	1	0	0			S17E13	E	
						N38E27	0	0	0			N38E27	Q	
						S22E40	0	0	0			S22E40	Q	
						N25E51	0	0	0			N25E51	Q	
004	4	3	148	135	09	N21W68	0	0	0	TENFLARE 03/1015Z	3	N21W68	Q	SOLALERT MINOR 04/XX MAGALERT MINOR
						S19W23	3	0	0	470 FLUX UNITS		S19W23	E	04/05
						N20W55	8	0	0	DURATION 20 MINUTES		N20W55	E	
						S18E04	4	0	0			S18E04	E	
						N16E16	1	0	0			N16E16	Q	
						N18E40	0	0	0			N18E40	Q	
						N16E63	0	0	0			N16E63	Q	
						N28E44	0	0	0			N28E44	Q	
						N17E19	0	0	0			N17E19	Q	
005	5	4	185	129	70	N22W84	0	0	0	GEOMAGNETIC STORM	4	N22W84	Q	SOLNIL MAGALERT 05/06
						S19W39	1	0	0	STARTED WITH SSC AT		S19W39	Q	
						N21W68	4	0	0	03/2042Z. REACHED		N21W68	Q	
						S18W11	1	0	0	STORM INTENSITY AT		S18W11	Q	
						N38E04	1	0	0	04/0300Z.		N38E04	Q	
						N19E28	0	0	0			N19E28	Q	
						N17E52	0	0	0			N17E52	Q	
						N23E28	0	0	0			N23E28	Q	
						N18W15	0	0	0			N18W15	Q	
006	6	5	142	122	21	S20W49	2	0	0		5	S20W49	Q	SOLQUIET MAGALERT 06 STRATWARM A.) STRATALERT WESTERN HEMISPHERE 05 JANUARY 1978. B.) ROCKET SOUNDINGS OVER NORTH AMERICA AND GREENLAND INDICATE SUBSTANTIAL WARMING AT LEVELS ABOVE 40 KM WITH TEMPERATURE AT 41 KM OF PLUS 19 DEGREES CELSIUS MEASURED AT WALLOPS ISLAND ON 04 JANUARY 1978. C.) STRATALERT EXISTS. CONTINUED DEVELOPMENT OF WARMING EVENT TRACKED BY BERLIN MESSAGES SINCE MID-DECEMBER. WARM AIR AND ANTICYCLONIC CIRCULATION CENTERED OVER ALEUTIAN AREA IN MID-STRATOSPHERE NOW SPREADING OVER ALASKA AND NORTHWEST CANADA.
						N19W79	5	0	0			N19W79	Q	
						S19W26	0	0	0			S19W26	Q	
						N36W09	0	0	0			N36W09	Q	
						N19E13	0	0	0			N19E13	Q	
						N17E38	0	0	0			N17E38	Q	
						N26E11	1	0	0			N26E11	Q	
						N16W27	0	0	0			N16W27	Q	
						S23E36	0	0	0			S23E36	Q	
007	7	6	103	124	24	S19W62	4	0	0		6	S19W62	E	SOLQUIET MAGALERT 07
						S17W37	0	0	0			S17W37	Q	
						N19E00	0	0	0			N19E00	Q	
						N22W00	0	0	0			N22W00	Q	
						N16W41	0	0	0			N16W41	Q	
						S25E25	0	0	0			S25E25	Q	
						N15E24	0	0	0			N15E24	Q	
008	8	7	72	115	07	S17W75	9	2	0	TENFLARE 07/0625Z	7	S17W75	A	SOLALERT 08/09 MAGALERT 08/10
						S16W52	0	0	0	680 FLUX UNITS DU-		S16W52	Q	
						N16E11	0	0	0	RATION 48 MINUTES.		N16E11	Q	
						N17W55	1	0	0	TENFLARE 07/1905Z		N17W55	Q	
										635 FLUX UNITS				
										DURATION 60 MINUTES				
009	9	8	64	106	14	S18W90	4	1	1	SOFLARE 2B/M3	8	S18W90	E	SOLALERT MAGALERT 9/10
						S18W65	0	0	0	S19W79, 08/0210Z		S18W65	Q	
						N15W71	1	0	0	DURATION 64 MINUTES		N15W71	Q	
						S24W03	2	0	0	TENFLARE 750 FLUX		S24W03	Q	
						N16W02	0	0	0	UNITS 08/0208Z		N16W02	Q	
										DURATION 14 MINUTES				
										SOFLARE 2B/X1,				
										S19W80 08/0706Z				
										DURATION 43 MINUTES				
										TENFLARE 170 FLUX				
										UNITS 08/0709Z.				
010	10	9	43	100	18	N20W40	0	0	0		9	N20W40	Q	SOLALERT 10 MAGALERT MINOR 9/12
						N17W14	0	0	0			N17W14	Q	
						S23W15	0	0	0			S23W15	Q	

ALERT PERIODS

INTERNATIONAL URSIGRAM
AND WORLD DAYS SERVICE

JANUARY 1978

SUMMARY OF THE GEOALERT WWA MESSAGES

Message serial number	Date of issue	Date of observation	Wolf number	10 cm solar flux	A index	Active Regions: Location Lat-Long	Flares: Total	Flares: M	Flares: X	Outstanding events	Forecasts: Date	Forecasts: Location Lat-Long	Forecasts: Desc*	Alert Situations
011	11	10	18	97	16	N19E24	0	0	0		10	N19E24	Q	SOLNIL MAGALERT MINOR 11/12
012	12	11	34	96	05	N21E07	3	0	0		11	N21E07	Q	SOLQUIET MAGNIL
						S20E76	0	0	0			S20E76	Q	
013	13	12	47	95	05	N20W04	3	0	0		12	N20W04	Q	SOLQUIET MAGQUIET
						S22E59	0	0	0			S22E59	Q	
						S26W16	0	0	0			S26W16	Q	
014	14	13	45	93	02	N20W17	0	0	0		13	N20W17	Q	SOLQUIET MAGQUIET
						S22E45	0	0	0			S22E45	Q	
						S25W30	0	0	0			S25W30	Q	
015	15	14	60	92	04	N20W30	1	0	0		14	N20W30	Q	SOLQUIET MAGQUIET
						S26E34	0	0	0			S26E34	Q	
						S26W43	0	0	0			S26W43	Q	
						S20W32	0	0	0			S20W32	Q	
016	16	15	69	94	04	N19W48	0	0	0		15	N19W48	Q	SOLQUIET MAGQUIET
						S27E22	0	0	0			S27E22	Q	
						S26W58	0	0	0			S26W58	Q	
						S21W45	0	0	0			S21W45	Q	
017	17	16	48	89	06	N17W60	0	0	0		16	N17W60	Q	SOLQUIET MAGQUIET STRATWARM ALERT
						S28E12	1	0	0			S28E12	Q	/TUESDAY/ STRATWARM EXISTS NORTH
						S27W70	1	0	0			S27W70	Q	CENTRAL SIBERIA
018	18	17	41	87	06	N18W73	0	0	0		17	N18W73	Q	SOLQUIET MAGQUIET STRATWARM ALERT
						S27W02	3	0	0			S27W02	Q	/WEDNESDAY/ STRATWARM EXISTS
						S26W83	0	0	0			S26W83	Q	NORTHERN SIBERIA
019	19	18	26	87	09	N15W85	0	0	0		18	N15W85	Q	SOLQUIET MAGQUIET STRATWARM ALERT
						S27W17	2	0	0			S27W17	Q	/THURSDAY/ STRATWARM EXISTS
														SIBERIAN ARCTIC
020	20	19	16	88	05	S29W25	0	0	0		19	S29W25	Q	SOLQUIET MAGQUIET STRATWARM ALERT
														/FRIDAY/ STRATWARM DECREASING OVER
														NORTHEASTERN SIBERIA. SUBSTANTIAL
														WARMING NOTED OVER ALASKA IN UPPER
														STRATOSPHERE
021	21	20	23	90	03	S29W38	0	0	0		20	S29W38	Q	SOLQUIET MAGQUIET
						N22E84	0	0	0			N22E84	Q	
022	22	21	44	94	02	S25W50	5	0	0		21	S25W50	Q	SOLQUIET MAGQUIET
						N22E66	0	0	0			N22E66	Q	
023	23	22	59	100	03	S23W65	5	0	0		22	S23W65	Q	SOLQUIET MAGQUIET
						N20E53	0	0	0			N20E53	Q	
						N20E44	0	0	0			N20E44	Q	
						S18E78	0	0	0			S18E78	Q	
024	24	23	66	103	04	S23W75	5	0	0		23	S23W75	Q	SOLQUIET MAGQUIET
						N20E39	0	0	0			N20E39	Q	
						N20E30	1	0	0			N20E30	Q	
						S17E65	0	0	0			S17E65	Q	
025	25	24	90	104	04	S23W89	0	0	0		24	S23W89	Q	SOLQUIET MAGQUIET
						N23E25	0	0	0			N23E25	Q	
						N19E12	1	0	0			N19E12	Q	
						S16E51	0	0	0			S16E51	Q	
026	26	25	77	107	07	N23E16	0	0	0		25	N23E16	Q	SOLQUIET MAGQUIET
						N19W00	6	0	0			N19W00	E	
						S18E39	0	0	0			S18E39	Q	
						S27E82	2	0	0			S27E82	E	
027	27	26	73	116	10	N27E00	0	0	0		26	N27E00	Q	SOLQUIET MAGQUIET
						N18W15	1	0	0			N18W15	Q	
						S18E25	0	0	0			S18E25	Q	
						S30E73	15	0	0			S30E73	E	
028	28	27	83	120	03	N22W12	0	0	0		27	N22W12	Q	SOLQUIET MAGQUIET
						N19W30	1	0	0			N19W30	Q	
						S29E59	11	0	0			S29E59	E	
						N39E04	0	0	0			N39E04	Q	
						S17E55	3	0	0			S17E55	E	
						N19E76	1	0	0			N19E76	Q	
029	29	28	89	133	05	N20W26	0	0	0		28	N20W26	Q	SOLALERT 29/XX MAGQUIET
						N17W44	2	0	0			N17W44	Q	
						S30E50	2	0	0			S30E50	E	
						N40W07	0	0	0			N40W07	Q	
						S16E43	0	0	0			S16E43	Q	
						N20E69	1	0	0			N20E69	Q	

ALERT PERIODS

INTERNATIONAL URSIGRAM AND WORLD DAYS SERVICE

JANUARY 1978

SUMMARY OF THE GEOALERT WWA MESSAGES

Message serial number	Date of issue	Date of observation	Wolf number	10 cm solar flux	A index	Active Regions				Outstanding events	Forecasts			Alert Situations
						Location Lat-Long	No. of Flares Total	M	X		Date	Location Lat-Long	Desc*	
030	30	29	151	137	32	N22W40	1	0	0	GRADUAL MINOR MAG-	30	N22W40	Q	SOLALERT 30/XX MAGALERT 30/01
						N19W60	0	0	0	STORM COMMENCEMENT		N19W60	C.A.	
						S30E36	0	0	0	29/0430Z		S30E36	C.A.	
						S18E30	2	0	0			S18E30	D.A.	
						N21E55	1	0	0			N21E55	Q	
						N15E40	0	0	0			N15E40	Q	
031	31	30	143	139	25	N18W55	0	0	0		31	N18W55	Q	SOLALERT 31/XX MAGALERT 31/01
						N17W75	0	0	0			N17W75	C.A.	STRATWARM ALERT/TUESDAY/ STRATWARM
						S28E23	1	0	0			S28E23	C.A.	EXISTS. STRONG WARMING OVER GREEN-
						S17E16	0	0	0			S17E16	Q	LAND TO ASIAN ARCTIC IN MIDDLE AND
						N18E39	0	0	0			N18E39	Q	UPPER STRATOSPHERE.
						N18E23	0	0	0			N18E23	Q	STRATALERT WESTHEM 30 JANUARY 1978.
						N17E60	0	0	0			N17E60	Q	STRONG WARMING NOTED IN UPPER STRATO-
														SPHERE 30 JANUARY FROM ROCKETSONDE
														AT THULE GREENLAND.
032	1	31	181	140	18	N21W66	0	0	0		31	N21W66	Q	SOLALERT 01/XX MAGALERT MINOR 01/03
						N18W87	1	0	0			N18W87	E	STRATWARM ALERT /WEDNESDAY/ STRAT-
						S30E09	0	0	0			S30E09	Q	WARM EXISTS. NORTHERN GREENLAND TO
						S18E02	0	0	0			S18E02	Q	EURASIAN ARCTIC.
						N19E29	1	0	0			N19E29	E	
						N15E13	0	0	0			N15E13	Q	
						N14E46	0	0	0			N14E46	Q	
						S28E29	0	0	0			S28E29	Q	
						S18E82	0	0	0			S18E82	Q	

* Q=Quiet E=Eruptive A=Active P=Proton C=Caution D=Doubtful O.G.=Other Groups MF=Major Flare

RELATIVE SUNSPOT NUMBERS

ZURICH, R_Z

1977 PROVISIONAL — 1978

DAY	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN
1	15	0	7	15	44	42	17	22	45	44	20	84
2	19	8	11	14	43	45	15	29	31	42	15	68
3	19	8	10	22	43	42	24	29	48	22	31	102
4	16	8	7	23	49	39	19	25	45	21	47	102
5	18	8	7	16	40	40	23	20	38	20	62	73
6	7	9	8	16	33	40	26	26	47	23	58	69
7	7	8	7	12	41	25	28	25	54	34	55	42
8	26	20	0	19	38	20	25	18	49	25	36	36
9	21	20	0	25	33	17	30	30	45	31	55	36
10	23	19	0	29	29	23	25	40	36	25	75	15
11	25	19	8	34	27	9	23	45	23	25	71	18
12	48	9	12	35	22	8	29	51	27	24	53	26
13	68	8	16	26	20	10	40	48	53	26	34	26
14	61	7	22	33	25	7	40	47	45	24	32	36
15	45	0	34	26	8	0	42	53	44	33	44	30
16	49	0	33	21	8	0	38	56	53	41	46	23
17	44	0	32	20	8	0	36	53	50	46	26	24
18	37	0	29	12	21	0	40	59	50	50	28	14
19	25	0	22	0	36	7	35	59	46	51	39	8
20	10	0	12	11	21	8	30	58	53	31	23	7
21	9	0	20	14	26	8	32	59	38	28	23	28
22	9	10	19	7	40	23	42	42	35	26	17	30
23	9	8	18	7	57	30	15	41	25	20	23	43
24	8	7	8	7	60	45	19	48	31	15	25	37
25	8	14	8	8	74	38	25	46	25	8	30	32
26	8	8	14	7	71	41	34	49	29	7	36	47
27	0	9	8	13	74	34	38	54	40	14	50	69
28	0	16	16	16	65	26	36	61	39	7	38	79
29		9	9	20	58	16	38	63	39	10	55	90
30		8	8	30	45	8	32	67	43	24	70	104
31		9		40		7	31		51		61	118
MEAN	22.6	8.0	13.2	18.4	38.4	21.2	29.9	44.1	41.3	26.6	41.3	49.3

1976 yearly mean = 12.6

DAILY SOLAR FLUX AT 2800 MHz
OTTAWA ARO

FLUX ADJUSTED TO 1 A.U., S_{ii}

1977 — 1978

DAY	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN
1	81.7*	72.6	74.8	77.2	88.9	102.0	83.0*	83.1	93.8*	94.4	88.4	126.9*
2	82.1	75.4	76.3	78.5	90.9*	100.7	82.9	84.2	93.2	93.6	91.2	133.9
3	80.9	74.8	76.6	81.9	93.0*	97.4	82.3	87.2	97.4	90.4	93.7	130.2
4	78.7	76.9	76.8	81.4*	94.2	94.0	82.9*	84.2	98.8	89.4	95.9	124.8
5	77.8	77.6	75.5	79.6	90.2*	88.0*	86.4	85.6	104.8*	90.6	96.9	119.2
6	75.2	77.6	76.1	78.5	90.6	90.2	88.2	84.9	103.5	91.1	102.0*	118.7*
7	74.6	77.2	75.5*	77.1*	92.0	85.2	86.9	89.3	105.5	90.2	105.5	111.6
8	78.6	81.6	74.3	77.9	91.9*	82.1	85.1	91.6	101.8	90.3	106.7	102.8
9	83.1	80.3	74.8	83.6	90.9	79.0	85.9	95.9	100.7	91.1	112.6*	97.0
10	83.5	80.5	76.5	80.8	89.2*	76.9	87.2	99.8	96.4	93.1	114.7	93.5
11	84.6	78.9	79.2	80.8	87.2	76.2	87.6	104.6	95.3	94.9	107.4	93.1
12	86.9*	78.6	80.2	79.7	83.3	75.8	86.5	107.8	100.8	91.4	111.8	92.1
13	88.5	77.9	82.7	81.5	84.2	77.8	89.0	112.9	98.5	94.0	100.6	90.3
14	85.2	77.2	83.4	84.8	82.3	76.8	87.5	118.2	98.9	97.9	93.7*	88.6
15	84.4	74.8	86.8	85.0	82.3	76.0	86.9	120.7	98.2	97.9	92.5	89.6
16	85.7	74.1	83.7	85.1	81.4	76.9	87.1	120.4	96.8	95.9	92.5	88.4
17	89.6*	74.1	83.6	84.1	82.4	76.5	87.1	120.6	94.9	100.4	91.1	83.8
18	86.5	73.9	80.8	82.9	84.3	76.9	88.6	120.5	95.4	102.0*	93.6	84.7
19	82.8	74.0	79.8*	82.1	85.2	76.9	87.8	104.5	105.8	99.2	91.0	85.4
20	81.1	72.3	80.4*	81.3	88.9	80.1	88.7	108.8	99.6*	95.7*	88.7	87.0
21	78.6	72.8	80.8	81.4	92.4	81.7	90.4	104.9*	98.6*	92.8	87.8	91.4
22	75.9	74.6	80.1	82.9	98.8*	83.1	89.4	102.4	93.9	89.3	89.9	96.9
23	75.9	74.7	77.5	82.4	99.4	85.8	86.8	99.3	87.3	88.0	91.2	99.6
24	74.2	74.8	76.5	79.2	107.4	84.0	86.0	100.6	88.3	86.7	93.9	100.4
25	74.3	74.8	76.4	77.4	113.8	86.0	87.7	98.8	88.1	84.7	96.3	103.3
26	72.3	75.1	75.4	76.8	120.7	86.8	86.4	99.4	88.6	84.1	99.3	112.7
27	72.8	74.5	74.9	77.9	115.9*	85.4	85.4	100.8	88.5	83.8	98.3	116.4
28	72.6	74.4	74.2	79.1	113.4	87.5	82.4	100.0	90.3*	85.6	98.9	127.7*
29		75.4	74.8	81.7	111.9	86.7	86.1	99.4	90.3	85.6	105.6*	132.2*
30		74.6	76.6	89.9	106.9	84.1	85.5	97.7	94.9	85.3	114.7	134.9
31		74.1		92.8		88.4	84.7		95.9		120.2	133.3*
MEAN	80.3	75.8	78.2	81.4	94.5	83.7	86.4	100.9	96.3	91.6	98.8	106.1

* adjusted for burst

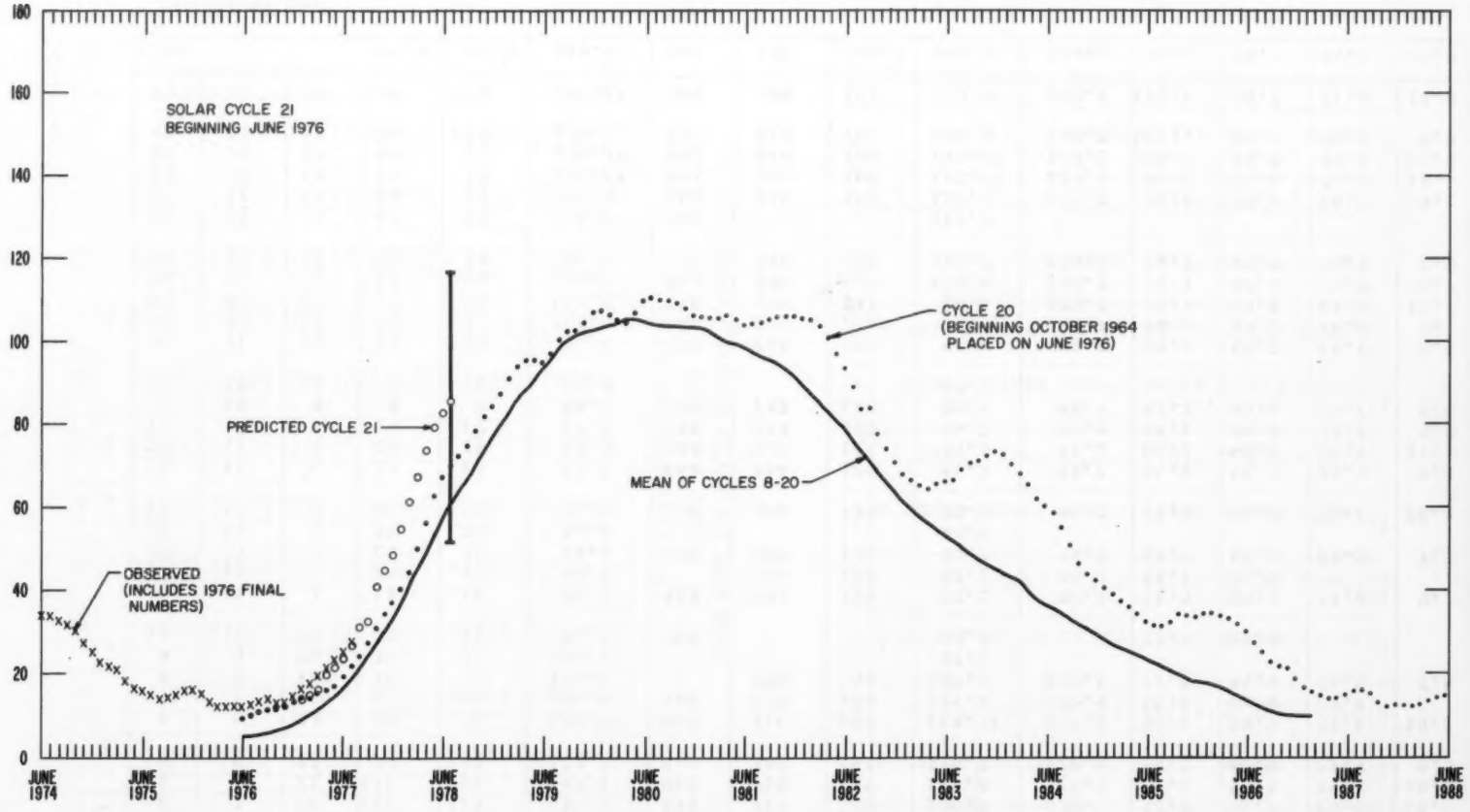
DAILY SOLAR INDICES

JANUARY 1978

JAN 1978	YEAR DAY	BARTELS 27-DAY CYCLE NUMBER	SUNSPOT NUMBERS		OBSERVED FLUX	SOLAR FLUX ADJUSTED TO 1 A.U.								
			R_Z	$R_{A'}$	OTTAWA 2800	AFGL 15400	AFGL 8800	AFGL 4995	OTTAWA 2800	AFGL 2695	AFGL 1415	AFGL 606	AFGL 410	AFGL 245
1	1	18	84	77	131.2*		307	164	126.9*	138.5	90.5	57.8	27.8	12.2
2	2	19	88	77	138.5		306	167	133.9	144.7	94.6	55.8	29.1	13.6
3	3	20	102	103	134.6	552	318	165	130.2	138.5	93.3	55.2	29.5	16.5
4	4	21	102	105	129.1	563	319	165	124.8	125.6	92.1	55.8	29.1	10.1
5	5	22	73	89	123.3	546	309	157	119.2	128.4	90.0	63.8	27.9	9.5
6	6	23	69	72	122.7*	546	311	160	118.7*	127.8	90.4	59.5	32.4	10.7
7	7	24	42	42	115.4	545	303	150	111.6	120.8	85.6	61.8	27.0	
8	8	25	36	32	106.3		295	141	102.8	109.6	78.8	54.4	26.9	7.6
9	9	26	36	21	100.3				97.0					
10	10	27	15	10	96.7	545			93.5		72.4	51.8		
11	11	1	18	16	96.3	548	291	133	93.1	98.9	68.3	50.1	30.2	9.7
12	12	2	26	20	95.2		290	133	92.1	96.3	68.1	51.9		
13	13	3	26	30	93.4	535	295	131	90.3	95.0	68.5	49.6	28.5	7.6
14	14	4	36	33	91.6				88.6					
15	15	5	30	30	92.7	537	282	132	89.6	91.7	70.5	56.9	36.0	26.4
16	16	6	23	18	89.3	540	284	126	86.4	90.1	64.0	46.2	26.4	8.2
17	17	7	24	25	86.6	528	282	125	83.8	88.4	62.2	48.2	26.4	11.2
18	18	8	14	12	87.5	526	280	125	84.7	85.8	65.1	44.4	30.0	9.8
19	19	9	8	8	88.2	540	283	126	85.4	88.7	62.3	43.4	25.7	8.6
20	20	10	7	5	89.9				87.0					
21	21	11	20	25	94.4	539	288	134	91.4	96.2	68.4	45.2	29.0	8.8
22	22	12	30	31	100.0	543	285	131	96.9	100.7	64.9	47.2	26.4	9.2
23	23	13	43	44	102.8	550	294	137	99.6	104.0	70.4	50.2	27.6	10.3
24	24	14	37	46	103.6	549	299	139	100.4	106.2	71.1	47.9	23.9	8.7
25	25	15	32	39	106.6	555	302	139	103.3	104.6	74.9	49.0	24.3	8.5
26	26	16	47	53	116.3	562			112.7					
27	27	17	69	68	120.0	563	310	158	116.4	125.7	86.6	53.4	28.8	9.1
28	28	18	79	79	131.6*	561	312	166	127.7*	138.4	94.2	56.4	30.1	10.5
29	29	19	90	90	136.3*	563	310	165	132.2*	139.0	100.7	60.9	33.1	11.9
30	30	20	104	100	139.1	564	318	164	134.9	144.0	100.1	64.4	30.6	9.8
31	31	21	118	114	137.3*	565	325	171	133.3*	145.6	100.8	59.7	31.4	10.8
MEAN			49.3	48.8	109.6	549	300	146	106.1	114.4	79.6	53.4	28.7	10.8

* Adjusted for burst.

Note: Data gaps in AFGL Sagamore Hill are due to equipment problems.



OBSERVED AND PREDICTED SUNSPOT NUMBERS

SMOOTHED OBSERVED AND PREDICTED SUNSPOT NUMBERS
CYCLE 21

MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1976	15.2	13.2	12.2	12.6	12.5	12.2	12.9	13.9	14.1	13.3	13.3	14.7
1977	16.6	17.9	19.8	21.9	23.7	25.6	28.1]	32.3	36.6	40.8	45.0	49.2
								(2)	(3)	(5)	(8)	(11)
1978	54.0	59.3	64.6	70.0	76.0	81.4	85.6	89.3	92.9	96.5	101.2	107.3
	(14)	(17)	(19)	(23)	(26)	(29)	(32)	(36)	(38)	(39)	(38)	(38)
1979	112.4	116.8	121.0	124.3	127.2	131.1	135.4	138.4	140.0	140.5*	140.4	139.5
	(38)	(39)	(40)	(40)	(41)	(44)	(45)	(46)	(48)	(51)	(53)	(55)
1980	137.9	136.5	135.8	135.8	134.8	132.0	129.0	126.5	125.1	124.5	123.3	122.4
	(55)	(55)	(54)	(54)	(56)	(56)	(56)	(56)	(55)	(55)	(56)	(58)
1981	122.5	121.9	119.8	117.1	115.3	113.9	113.4	113.7	113.4	112.4	110.6	107.8
	(59)	(59)	(57)	(55)	(54)	(52)	(51)	(49)	(48)	(47)	(45)	(43)
1982	104.6	101.4	98.9	97.2	95.1	92.3	88.3	83.9	80.2	76.2	73.2	69.9
	(41)	(40)	(39)	(38)	(36)	(35)	(33)	(31)	(29)	(25)	(24)	(23)
1983	66.5	64.2	62.6	60.9	59.1	56.9	55.3	53.9	52.5	51.2	50.2	49.5
	(22)	(22)	(22)	(22)	(22)	(23)	(24)	(25)	(27)	(28)	(30)	(30)
1984	48.3	46.5	43.8	40.6	38.2	37.0	35.8	34.0	32.5	31.5	30.4	29.0
	(30)	(29)	(28)	(28)	(29)	(31)	(31)	(31)	(30)	(28)	(27)	(27)
1985	27.9	27.0	26.1	25.5	24.7	23.7	22.9	22.1	21.5	20.7	19.7	19.2
	(26)	(26)	(26)	(26)	(25)	(24)	(23)	(22)	(22)	(23)	(23)	(24)
1986	19.1	18.8	18.2	17.3	16.3	15.3	14.4	13.8	13.3	12.9	12.7	12.4
	(24)	(24)	(23)	(22)	(21)	(20)	(19)	(18)	(17)	(15)	(14)	(13)
1987	12.3	12.5	13.0	13.7	14.5							
	(11)	(11)	(11)	(12)	(13)							

The table gives observed Zürich smoothed sunspot numbers for Cycle 21 up to the one calculated from the latest observed data, marked by a vertical bar. They are based on final Zürich numbers through 1976 and provisional Zürich numbers thereafter. Some of these data after the June 1976 value will change slightly when final data for 1977 are received. The numbers after the vertical bar are predictions by the McNish-Lincoln method (see *Explanation of Data Reports*, February 1978). Shown in parentheses are the corresponding absolute values of the 90% confidence interval, an indication of the uncertainty above and below the predicted number.

The McNish-Lincoln method is very sensitive to the identification of a minimum epoch. In SGD 390-401 issues, the Cycle 21 predictions were based on March 1976 as the minimum epoch. Latest studies, including one published by Waldmeier, show that June 1976 is the more appropriate epoch of minimum. Thus, we have adopted a June 1976 mimimum.

*Prediction of Sunspot Maximum -- The McNish-Lincoln prediction method is recommended for predictions up to only one year ahead. From that point, the predictions regress rapidly towards the mean value. Combining this McNish-Lincoln prediction of sunspot maximum with the Ohl method (as done by Sargent, see *Explanation of Data Reports*, February 1978) indicates that the most probable value for sunspot maximum is 148 ± 32.

Hα SOLAR FLARES

JANUARY 1978

OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IM-POR-TANCE	OBS.		MEASUREMENTS			REMARKS
	DATE JAN	START	MAX. PHASE	END	APPROX. LAT.	APPROX. MER. DIST.	CENTRAL DISTANCE	MCMATH PLAGE REGION	CMP DAY	MIN.		COND.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR. AREA Sq. Deg.	
MANI	01	0554	0600	0626	S18	E37	.613	15083	4.0	32	1N	3	P		200	2.7	F
TEHR	01	0554	0557	0606	S17	E38	.623	15083	4.1	12	1N	2	C		190		FDE
TEHR	01	0727	0730	0737	S18	E13	.294	15081	2.3	10	1F	2	C		63		
MANI	01	0732E	0732U	0738	S19	E12	.294		2.2	6D	SF	3	V		80	.8	H
TEHR	01	0920	0922	0932	S17	E37	.610	15083	4.2	12	1N	1	C		127		FDE
HTPR	01	1410E		1518	S22	E29	.529		3.8	68D	SF		C	1414	50	.6	
HTPR	01	1430	1432	1444	S19	E34	.578		4.2	14	SF		C	1432	20	.2	
HTPR	01	1435	1438	1448	N21	W22	.574		31.0	13	SF		C	1438	10	.1	
HTPR	01	1502	1506	1526	S19	E33	.565		4.1	24	SN		C	1505	80	.9	E
HTPR	01	1503	1506	1546	S22	E28	.517		3.7	43	SN		C	1506	60	.7	
MANI	02	0345E	0345U	0355	S24	E19	.427		3.6	10D	SF	3	V		30	.3	
MANI	02	0345E	0345U	0352	N20	W26	.599		31.2	7D	SF	3	V		40	.5	
MONT	02	0947	0948	0953	S17	W01	.183		2.3	6	SF		C	0948	50		
MONT	02	1047	1048	1059	N20	W44	.774		30.1	12	SF		C	1048	50		E
RAMY	02	1646	1649	1658	S14	E17	.314		4.0	12	SN	3	C		32		H
PALE	02	1925	1928	1944	N19	W38	.711		31.0	19	SN	3	C		115		FDE
RAMY	02	1940E	1942U	1950	N21	W39	.733		30.9	10D	SN	3	C		95		F
PALE	02	2231	2244	2319	S19	E14	.317		4.0	48	SN	3	C		136		DE F
PALE	02	2358	2359	0000	N19	W43	.760		30.8	2	SF	3	C		62		DE
MANI	03	0204	0209	0215	S21	W06	.270		2.6	11	SN	3	P		60	.6	F
MANI	03	0230	0235	0259	N19	W44	.769		30.8	29	SN	3	P		80	1.2	F
MONT	03	0930E	0937	0941	N23	W47	.815		30.9	11D	SF		C	0937	50		D
MONT	03	0930E	0935	0943	S15	E07	.190		3.9	13D	SF		C	0935	60		E
HTPR	03	1015		1039D	S18	E09	.251	15049	4.1	24D	1B		C	1020	400	4.0	EU
WEND	03	1026E		1050D	S14	E07	.177	15081	4.0	24D	1N		P		400	4.0	
RAMY	03	1156E	1200	1209D	S19	W19	.380		2.1	13D	SN	4	C		45		DE
HTPR	03	1353	1355	1358	S21	E05	.265		4.0	5	SF		C	1355	30	.3	E
MCMA	03	1526	1527	1529D	N23	W52	.855	15080	30.7	3D	SN		P	1527	40	.7	E
MCMA	03	1533E	1535	1541D	S20	W22	.427	15081	2.0	8D	SF		P	1535	25	.3	D
MCMA	03	1617	1626	1630	S20	W22	.427	15081	2.0	13	SN		C				
MCMA	03	1617	1620	1630	S20	W22	.427	15081	2.0	13	SN		C	1620	40	.5	EK
MCMA	03	1700	1701	1709	S20	W22	.427	15081	2.1	9	SF		C	1701	30	.4	E
RAMY	03	1802E	1804	1818	S23	E37	.633		6.5	16D	SN	4	C		95		F R
MCMA	03	1826	1828	1850	S20	W19	.389	15081	2.3	24	SN		C	1828	25	.3	D
RAMY	03	1852	1854	1906	S20	E 7	.262	15083	4.3	14	1N	3	C		206		F
MCMA	03	1902E		1903D	S21	E07	.277	15083	4.3	1D	SN		P	1903	35	.4	D
PALE	03	2144	2145	2151	S19	E 2	.220		4.1	7	SF	3	C		37		DE
PALE	03	2358	2359	0001	N19	W43	.759		31.8	3	SF	3	C		62		DE
HTPR	04	0904E		0935D	N20	W80	.992		29.4	31D	SF		C	0911	20	.5	
HTPR	04	1236	1237	1244	N20	W83	.997		29.3	8	SF		C	1237	10	.2	
HTPR	04	1330	1331	1335	N19	W70	.958		30.3	5	SF		C	1331	20	.5	
PALE	04	1812	1826	1846	N21	W66	.941		30.8	34	SF	3	V		26		F
PALE	04	1812	1826	1846	N21	W66	.941		30.8	34	SF	3	C		26		F
PALE	04	1925	1925	1936	N21	W66	.941		30.9	11	SF	3	C		17		F
PALE	04	1925	1925	1936	N21	W66	.941		30.9	11	SF	3	V		17		F
PALE	04	2010	2011	2019	N21	W67	.947		30.8	9	SF	3	C		17		F
PALE	04	2010	2011	2019	N21	W67	.947		30.8	9	SF	3	V		17		F
PALE	04	2115	2117	2124	N21	W67	.947		30.9	9	SF	3	C		33		F
PALE	04	2115	2117	2124	N21	W67	.947		30.9	9	SF	3	V		33		F
PALE	04	2308	2313	2335	S19	W13	.307		4.0	27	SN	3	C		73		DE
PALE	04	2319	2322	2330	S19	W36	.605		2.3	11	SF	3	C		40		DE
PALE	05	0018	0038	0056	N21	W69	.956		30.8	38	SF	3	C		30		DE
PALE	05	0116	0116	0124	N21	W69	.956		30.9	8	SF	3	C		21		DE
MANI	05	0353E	0353U	0357	N19	W71	.963		30.8	4D	SF	3	P		20	.4	
MANI	05	0514E	0514U	0531D	N19	W74	.975		30.7	17D	SF	3	P		20	.5	
HTPR	05	1034	1044	1110	S16	W20	.372		3.9	36	SF		C	1044	20	.2	
MONT	05	1034	1044	1106	S14	W20	.360		3.9	32	SF		C	1044	60		E
HTPR	05	1419	1431	1435	S25	E43	.709		8.8	16	SF		C	1431	20	.3	
HTPR	05	1438	1442	1448	S25	E43	.709		8.8	10	SF		C	1442	10	.1	
HTPR	05	1448	1456	1503	S17	W46	.721		2.2	15	SF		C	1456	20	.3	
HTPR	05	1506	1516	1525	S25	E42	.698		8.8	19	SF		C	1516	20	.3	
PALE	05	1858	1859	1903	N21	W79	.990		30.9	5	SF	3	C		21		DE F
PALE	05	2028	2030	2037	N21	E13	.502		6.8	9	SF	3	C		28		DE
PALE	05	2031	2040	2102	S19	W48	.747		2.3	31	SF	3	C		35		DE
BUCA	06	0810		0845	S16	W56	.826		2.1	35	SF		C	0833	53	1.0	D
HTPR	06	0826	0832	0836	S19	W56	.828		2.2	10	SF		C	0832	40	.7	
HTPR	06	0851	0857	0913	S15	W60	.861		1.9	22	SF		C	0857	20	.4	

Hα SOLAR FLARES

JANUARY 1978

OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
	DATE JAN	START	MAX. PHASE	END	APPROX. LAT.	APPROX. MER. DIST.	CENTRAL DISTANCE	MCMATH PLAGE REGION	CMP DAY	MIN.		CORD.	TYPE	TIME UT	MEAS. AREA Millionths of Disk	CORR. AREA Sq. Deg.	
HTPR	06	0901	0903	0906	S19	W56	.828		2.2	5	SF		C	0903	40	.7	
HTPR	06	1014	1015	1019	S19	W56	.828		2.2	5	SF		C	1015	50	.7	
MONT	06	1015	1016	1018	S20	W55	.820		2.3	3	SF		C	1016	40		D
HTPR	06	1022	1025	1031	N17	E33	.644		8.9	9	SF		C	1025	10	.1	
MONT	06	1056	1101	1111	S15	W53	.795		2.5	15	SF		C	1101	50		
HTPR	06	1107	1110	1116	S19	W57	.837		2.2	9	SF		C	1110	20	.3	
MONT	06	1110	1112	1114	S20	W50	.770		2.7	4	SF		C	1112	40		D
HTPR	06	1103	1106	1119	N16	W17	.468		5.2	16	SF		C	1106	30	.3	
HTPR	06	1321	1323	1326	N17	E32	.633		9.0	5	SF		C	1323	10	.1	
RAMY	06	1635E	1638U	1715D	S17	W60	.862		2.2	40D	SN	3	C		95		F
PALE	06	1804	1852	1912D	S19	W61	.871		2.2	68D	SF	3	C		53		DE
PALE	07	0046E	0136U	0222D	N19	W64	.926	15079	2.2	96D	1N	3	C		250		U F
MANI	07	0637E	0637U	0639D	S15	W64	.894	15081	2.5	2D	1N	3	V		100	2.1	
BUCA	07	0740		0810	S16	W73	.951		1.8	30	SF		P	0745	43		D
HTPR	07	0757E		0825	S19	W68	.922		2.2	28D	SF		C	0804	40	.8	
MONT	07	1114	1213	1325D	S22	W71	.940	15081	2.1	131D	1N		C	1213	220		F
HTPR	07	1145	1215	1320	S18	W70	.934		2.2	95	SN		C	1215	60	1.3	E
HTPR	07	1150	1209	1222	S22	W69	.929		2.3	32	SF		C	1209	40	.8	
RAMY	07	1225E	1228	1235D	S18	W71	.940		2.2	10D	SN	2	C		96		DE
WEND	07	1228E		1308	S19	W70	.934	15081	2.3	40D	1F		V		300	9.9	E
HTPR	07	1334	1338	1347	S24	W43	.706		4.3	13	SF		C	1338	20	.3	
HTPR	07	1452	1454	1458	S21	W73	.951		2.1	6	SF		C	1454	40	.9	
MANI	08	0210	0216	0318D	S12	W80	.982	15081	2.1	68D	1N	3	P		80	2.1	F
MANI	08	0210	0237	0318	S12	W80	.982	15081	2.1	68	2N	3	P		200	5.3	F
PALE	08	0219E	0246U	0323D	S19	W78	.973	15081	2.2	64D	2B	3	C		250		FDE
PALE	08	0219E	0219U	0323D	S19	W78	.973	15081	2.2	64D	1B	3	C		200		FDE
PALE	08	0219E	0219U	0323D	N19	W78	.987	15087	2.2	64D	1B	3	C		200		FDE
PALE	08	0219E	0246U	0323D	N19	W78	.987	15081	2.2	64D	2B	3	C		250		FDE
MANI	08	0710	0713	0749	S12	W85	.994	15081	1.9	39	2B	3	P		300	8.8	F
HTPR	08	0903	0909	0912	S18	W88	.998		1.8	9	SN		C	0909	20		
HTPR	08	1150	1155	1220	S14	W60	.861		4.0	30	SF		C	1155	10	.2	
MONT	09	1107	1111	1124D	S19	W90	.999		2.7	17D	SF		C	1111	60		
HTPR	09	1119	1124	1130	S23	W11	.342		8.6	11	SF		C	1124	10	.1	
PALE	09	2255	2258	2306	S18	W79	.977	15083	4.0	11	1N	3	V		115		FDE
PALE	11	0151	0157	0210	N18	E23	.544		12.8	19	SF	3	V		25		F
MCMA	11	1745	1750	1825D	N18	E12	.449	15097	12.6	40D	SN		C	1750	60	.7	E
RAMY	11	1755E	1758	1800D	N18	E14	.464		12.8	5D	SF	4	C		64		DE
PALE	11	2241	2249	2306	N18	E11	.443		12.8	25	SN	3	C		53		DE
PALE	11	2241	2246	2306	N18	E11	.443		12.8	25	SF	3	C		43		DE
RAMY	12	1450E	1453	1459	N19	W 1	.421		12.5	9D	SF	3	C		60		DE
BUCA	13	0845		0900	S27	W20	.477		11.9	15	SF		P	0855	53	.6	D
MANI	16	0301	0304	0315D	S27	W58	.858		11.8	14D	SF	3	P		30	.5	F
RAMY	17	1359E	1400	1428D	S27	E 3	.370	15100	17.8	29D	1N	4	C		280		F
PALE	21	0100	0101	0104	S27	W41	.704		18.0	4	SF	3	C		26		DE
RAMY	21	1438E	1440U	1458D	S24	W44	.723		18.3	20D	SN	4	C		32		
HTPR	21	1516		1526D	S23	W44	.720		18.3	10D	SF		C	1517	30	.4	
PALE	21	1844	1845	1856	S24	W46	.744		18.3	12	SF	3	C		30		F
PALE	21	2134	2139	2145	S24	W48	.764		18.3	11	SF	3	C		29		F
PALE	21	2155	2203	2214D	S24	W48	.764		18.3	19D	SF	3	C		75		DE
PALE	22	1818	1843	1904	S24	W60	.871		18.3	46	SF	3	C		37		F
PALE	22	1920	1925	2019	S26	W60	.874		18.3	59	SF	3	C		85		F
PALE	22	2023	2024	2042	S23	W61	.878		18.3	19	SF	3	C		79		F
PALE	22	2049	2054	2200	S24	W60	.871		18.4	71	SF	3	C		58		F
PALE	22	2231	2308	2356	S23	W63	.893		18.2	85	SF	3	C		48		F
PALE	23	0004	0018	0035	S23	W63	.893		18.3	31	SF	3	C		31		F
PALE	23	0049	0127	0132	S23	W64	.900		18.2	43	SF	3	C		41		F
PALE	23	0252	0253	0308	S23	W65	.907		18.2	16	SF	3	C		59		F
PALE	23	0332	0333	0337	S23	W65	.907		18.3	5	SF	3	C		54		F
MANI	24	0622	0624	0629	N20	E25	.573		26.1	7	SF	3	P		30	.3	

Hα SOLAR FLARES

JANUARY 1978

OBSERVATORY	OBSERVED UT				LOCATION					DURATION — MIN.	IMPORTANCE	OBS. CORD.	OBS. TYPE	MEASUREMENTS' TIME — UT	MEASUREMENTS' MEAS. AREA Mill. of Disk	MEASUREMENTS' CORR. AREA Sq. Deg.	REMARKS
	DATE - JAN	START	MAX. PHASE	END	APPROX. LAT.	APPROX. MER. DIST.	CENTRAL DISTANCE	MCMATH PLAGE REGION	CMP DAY								
MANI	25	0219	0221	0232	N20	E08	.438		25.7	13	SF	3	P		30	.3	F
RAMY	25	1647E	1650U	1705	N20	E 2	.420		25.8	18D	SF	3	C		32		F R
PALE	25	1950E	2000U	2017D	N19	E 2	.404		26.0	27D	SF	3	C		45		F
PALE	26	0053E	0055	0210D	S28	E83	.989		2.3	77D	SF	3	C		57		FDE
PALE	26	0053E	0207	0210D	S28	E83	.989	15124	2.3	77D	1F	3	C		85		FDE
ATHN	26	0610E	0640	0742	S31	E80	.982	15081	2.3	92D	1N	1		0640	82	3.3	
MONT	26	0857	0904	0920D	N19	W03	.404		26.1	23D	SF		C	0904	60		E
HTPR	26	0857	0900	0924	N18	W07	.402		25.8	27	SF		C	0900	10	.1	
HTPR	26	1011	1014	1021	S26	E80	.982		2.4	10	SF		C	1014	20		
HTPR	26	1031	1043	1105	N20	W08	.437		25.8	34	SF		C	1043	40	.4	E
HTPR	26	1032	1036	1043	S26	E80	.982		2.4	11	SF		C	1036	30		
MONT	26	1038E	1038	1046	S25	E83	.990		2.7	8D	SN		C	1038	70		D
MONT	26	1052	1108	1118	S25	E83	.990		2.7	26	SF		C	1108	40		E
HTPR	26	1054	1057	1110	S26	E80	.982		2.5	16	SF		C	1057	10		
MONT	26	1125	1131	1146	S26	E82	.987		2.6	21	SN		C	1131	60		E
HTPR	26	1128	1131	1137	S28	E80	.982		2.5	9	SF		C	1131	20		
MONT	26	1247	1249	1253	S33	E85	.993		2.9	6	SF		C	1249	40		D
MONT	26	1325	1327	1331	S25	E82	.987		2.7	6	SF		C	1327	20		D
HTPR	26	1339	1344	1350	S27	E79	.978		2.5	11	SN		C	1344	60		E
PALE	26	1826	1826	1833	S33	E76	.969		2.5	7	SF	3	C		30		DE
PALE	26	1845	1845	1859	S30	E75	.964		2.4	14	SF	3	C		50		DE
PALE	26	1954	1954	2001	S33	E75	.965		2.5	7	SF	3	C		21		DE
PALE	26	2017	2018	2026	S33	E75	.965		2.5	9	SF	3	C		41		DE
PALE	26	2029	2031	2053	S33	E75	.965		2.5	24	SN	3	C		45		DE
PALE	26	2121	2127	2137	S33	E74	.962	15124	2.4	16	1N	3	C		115		DE F
PALE	26	2251	2251	2259	N19	W15	.468		25.8	8	SF	3	C		40		F
PALE	26	2251	2251	2259	N19	W15	.468		25.8	8	SF	3	V		40		F
PALE	26	2312	2313	0020	N19	W14	.460		25.9	68	SN	3	C		71		FDE
PALE	26	2316	2316	2319	S30	E73	.956		2.4	3	SF	3	V		22		F
PALE	26	2316	2316	2319	S30	E73	.956		2.4	3	SF	3	C		22		F
PALE	26	2357	0017	0021D	S28	E84	.991		3.3	24D	SF	3	C		47		DE
PALE	27	0116	0117	0123	S27	E73	.955		2.5	7	SF	3	V		27		F
PALE	27	0147	0148	0202	S27	E73	.955		2.5	15	SF	3	V		31		F
PALE	27	0231	0232	0236	S27	E73	.955		2.6	5	SF	3	V		18		F
MONT	27	0846	0851	0900	S32	E72	.953	15124	2.8	14	1N		C	0851	200		
MONT	27	0855	0856	0900	S25	E70	.939		2.6	5	SF		C	0856	20		D
MONT	27	0949	0952	1000	N19	W21	.520		25.8	11	SF		C	0952	60		E
MONT	27	1021	1025	1047	N19	E90	1.000		4.2	26	SN		C	1025	70		H
PALE	27	1813	1815	1815	S17	E60	.866		2.3	2	SF	3	C		15		DE
PALE	27	1837	1838	1854	S17	E59	.858		2.2	17	SN	3	C		111		DE
PALE	27	1838	1839	1856	S32	E68	.933		2.9	18	SF	3	C		39		DE
PALE	27	1940	1940	1946	S32	E67	.928		2.8	6	SF	3	C		15		DE
PALE	27	2023	2025	2027	S32	E67	.928		2.9	4	SF	3	C		24		DE
PALE	27	2037	2040	2103	S17	E58	.849		2.2	26	SF	3	C		25		DE
RAMY	27	2044E	2046	2050	S16	E62	.882		2.5	6D	SF	3	C		80		
MANI	28	0450	0455	0506	S19	E13	.330		29.2	16	SF	3	P		40	.4	H
PALE	28	1818	1819	1825	N18	W39	.701		25.8	7	SF	3	C		19		DE
PALE	28	1910	1912	1916	S30	E51	.813		2.6	6	SF	3	C		20		DE
PALE	28	1944E	1954	2033	N18	W41	.722		25.7	49D	SF	3	C		87		DE F
PALE	28	1949	1949	1959	S18	E46	.731		2.3	10	SF	3	C		24		DE
PALE	28	1949	1951	1959	S18	E46	.731		2.3	10	SF	3	C		24		DE
PALE	28	1958	2002	2022	S30	E50	.804		2.6	24	SF	3	C		91		DE F
PALE	28	2222	2224	2247	N20	W40	.723		25.9	25	SF	3	C		101		DE
PALE	29	2027E	2027U	2045	S17	E31	.543		2.2	18D	SF	3	C		24		F
MANI	30	0138	0143	0211D	S31	E36	.683	15124	2.8	33D	1N	3	P		160	2.2	F
PALE	30	0139	0140	0219	S29	E34	.651	15124	2.6	40	1N	3	C		287		F
HTPR	30	1249	1250	1253	N14	W67	.933		25.5	4	SN		C	1250	30	.7	
HTPR	30	1305	1308	1311	N13	W67	.932		25.5	6	SF		C	1308	10	.2	
HTPR	31	0844E		0853	N18	E39	.700		4.3	9D	SF		C	0847	20	.2	
HTPR	31	1232	1238	1242	N18	E37	.678		4.3	10	SF		C	1238	30	.4	E
HTPR	31	1326	1330	1338	N18	E37	.678		4.3	10	SF		C	1330	50	.6	E
HTPR	31	1402	1412	1435	N18	E35	.656		4.2	33	SF		C	1412	50	.6	E
PALE	31	2101	2103	2106	N18	W88	1.000		25.3	5	SF	3	C		18		F

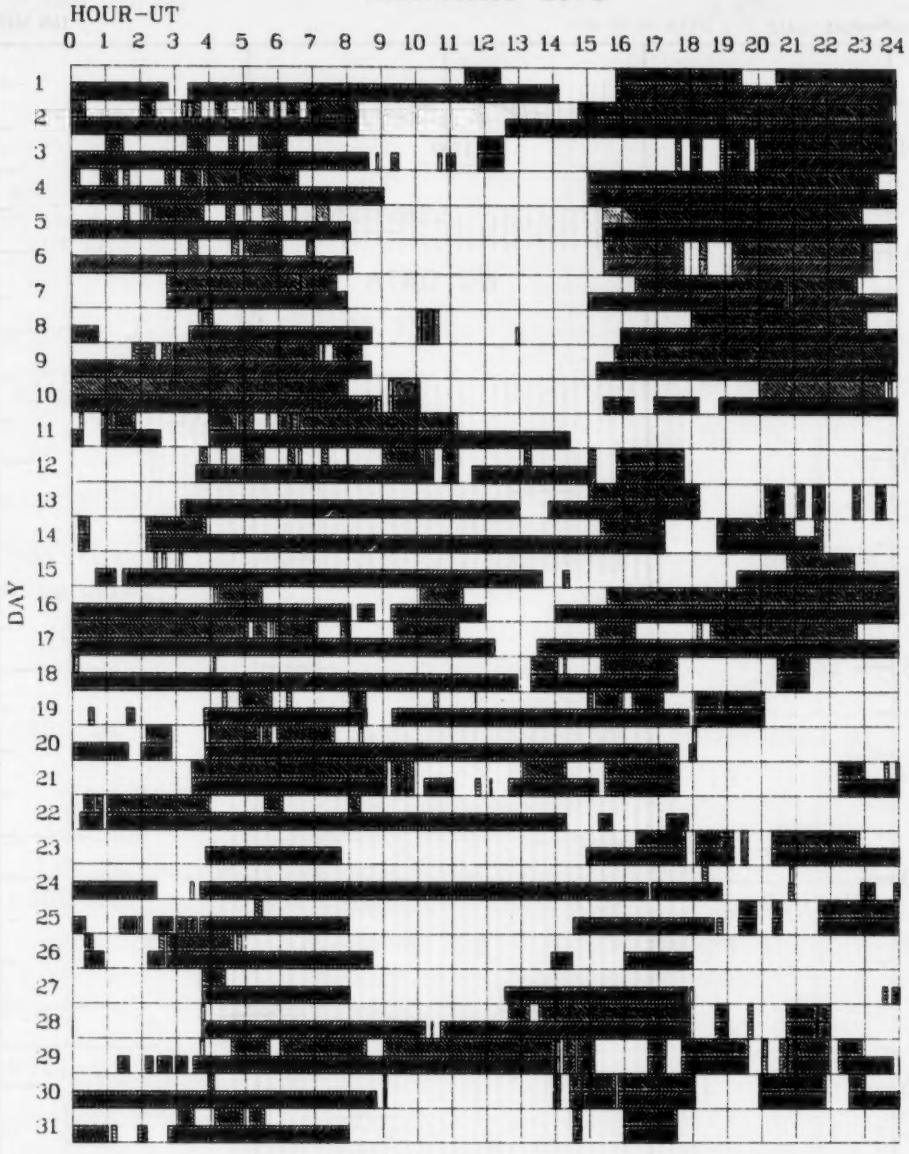
"Remarks":

A = Eruptive prominence whose base is less than 90° from central meridian.
B = Probably the end of a more important flare.
C = Invisible 10 minutes before.
D = Brilliant point.
E = Two or more brilliant points.
F = Several eruptive centers.
G = No visible spots in the neighborhood.
H = Flare accompanied by a high speed dark filament.
I = Active region very extended.
J = Distinct variations of plage intensity before or after the flare.
K = Several intensity maxima.
L = Existing filaments show signs of sudden activity.
M = White-light flare.
N = Continuous spectrum shows effects of polarization.
O = Observations have been made in the calcium II lines H and K.
P = Flare shows helium D_3 in emission.
Q = Flare shows the Balmer continuum in emission.
R = Marked asymmetry in Hα line suggests ejection of high velocity material.
S = Brightness follows disappearance of filament (same position).
T = Region active all day.
U = Two bright branches, parallel (||) or converging (Y).
V = Occurrence of an explosive phase: important and abrupt expansion in about a minute with or without important intensity increase.
W = Great increase in area after time of maximum intensity.
X = Unusually wide Hα line.
Y = System of loop-type prominences.
Z = Major sunspot umbra covered by flare.

INTERVALS OF NO FLARE PATROL OBSERVATION

FOR PRECEDING SOLAR FLARE TABLE

JANUARY 1978



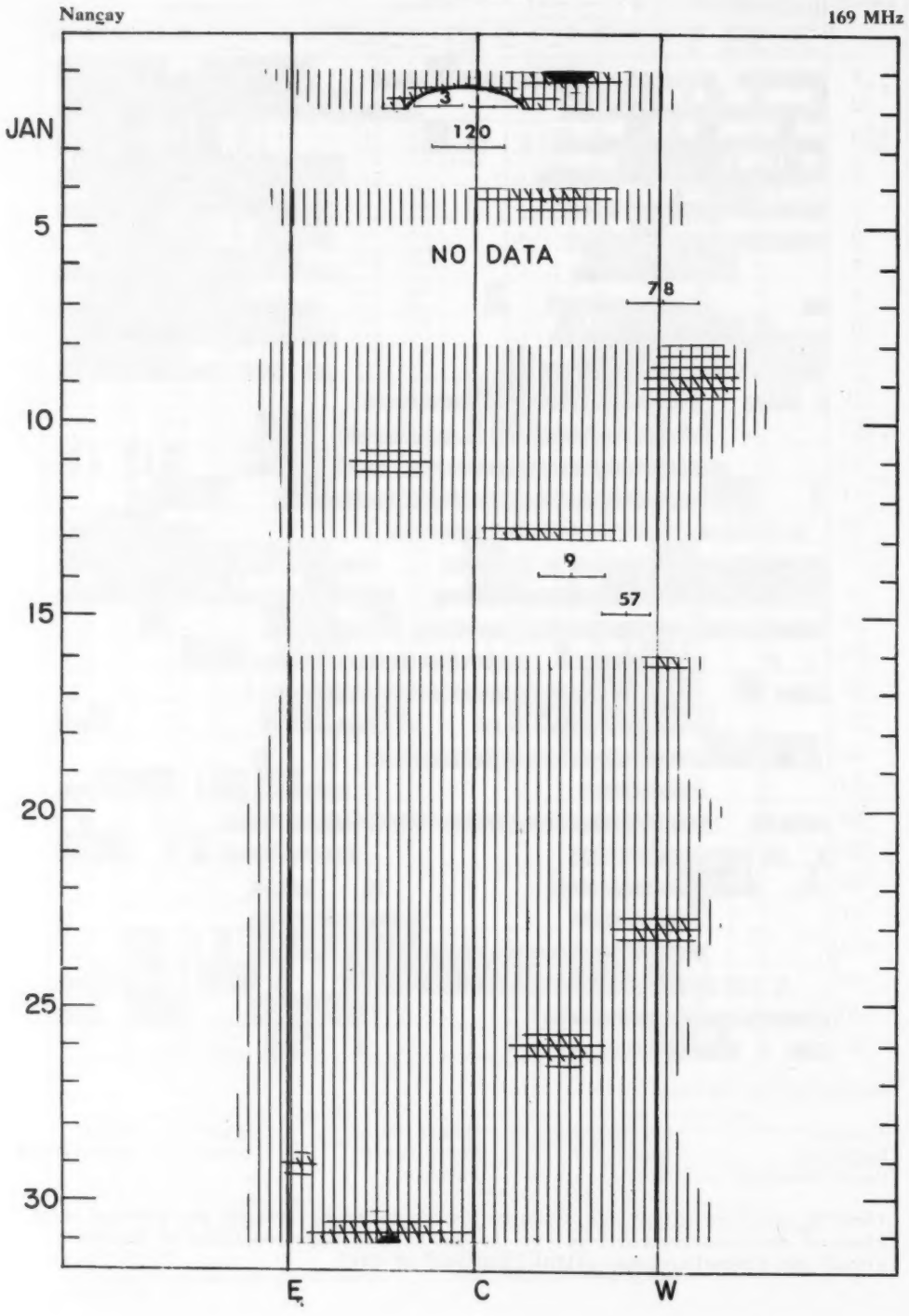
Observatories included in total patrol:

Athenes	Herstmonceux	McMath-Hulbert	Ramey	Upice
Bucharest	Kandilli	Monte Mario	Tehran	Wendelstein
Haute Provence	Manila	Palehua		

Times of no flare patrol are shown by the shaded area for each day divided into times of no cinematographic patrol (bottom half of day) and times of neither visual nor cinematographic patrol (top half of day).

SOLAR RADIO EMISSION
INTERFEROMETRIC OBSERVATION

JANUARY 1978

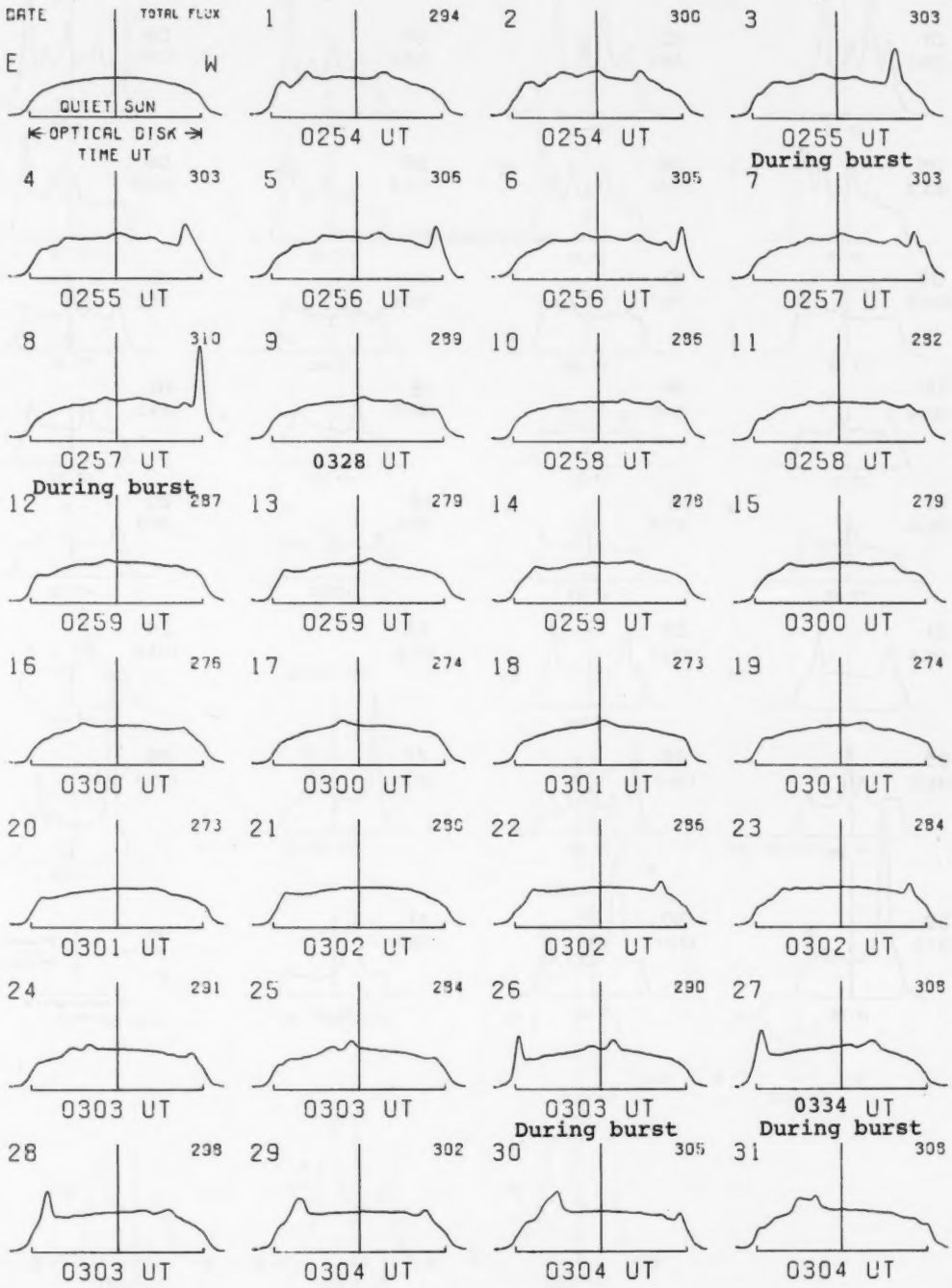


EAST-WEST SOLAR SCANS

JANUARY 1978

TOYOKAWA, JAPAN

3 CM
FAN BEAM WITH 1.1 MINUTES OF ARC

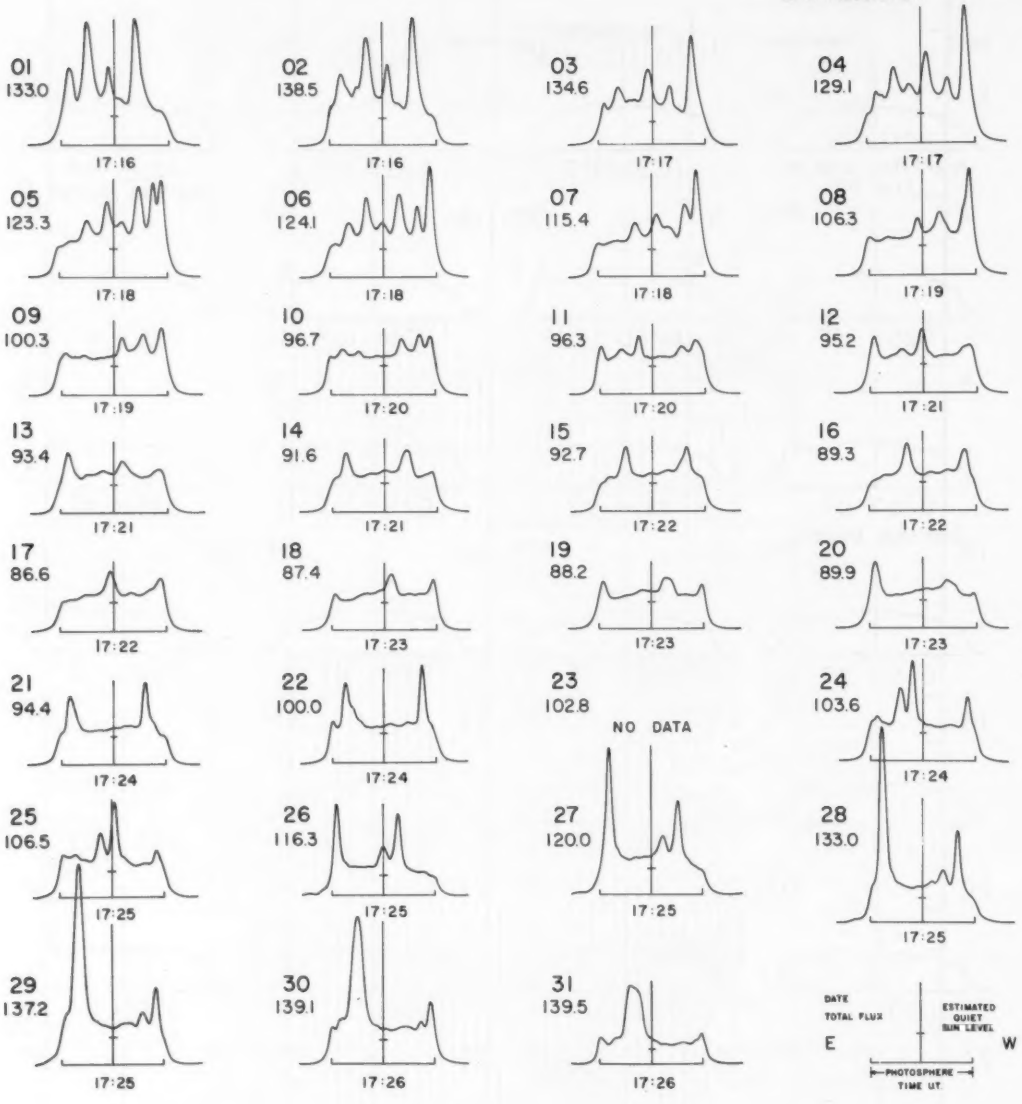


EAST-WEST SOLAR SCANS

ALGONQUIN RADIO OBSERVATORY
CANADA

JANUARY 1978

10·7cm
Fan Beam with 1·5 minutes of arc
E-W Resolution

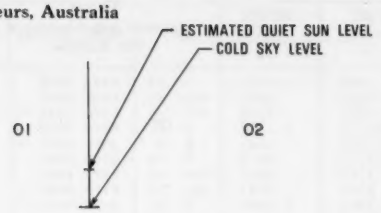


EAST-WEST SOLAR SCANS

JANUARY 1978

Fleurs, Australia

21 cm
Fan-Beam with 2 minutes of arc
E-W Resolution



01 02 03 04

05 06 07 08

NO DATA JANUARY 1-22

09 10 11 12

13 14 15 16

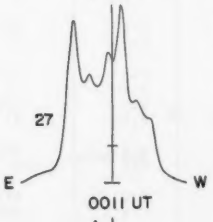
17 18 19 20

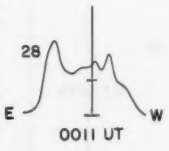
21 22

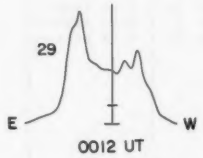
24 NO DATA

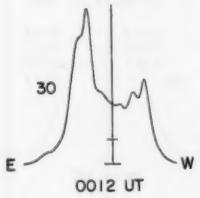
25 NO DATA

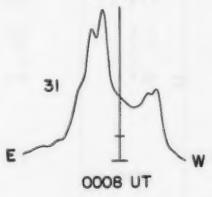
26 NO DATA









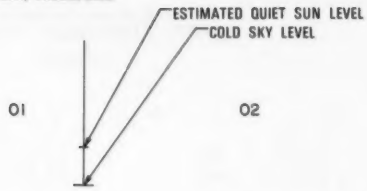


EAST-WEST SOLAR SCANS

JANUARY 1978

Fleurs, Australia

43 cm
Fan-Beam with 4 minutes of arc
E-W Resolution



01 02 03 04

05 06 07 08

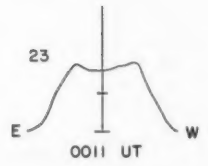
NO DATA JANUARY 1 - 22

09 10 11 12

13 14 15 16

17 18 19 20

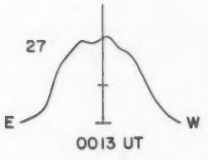
21 22

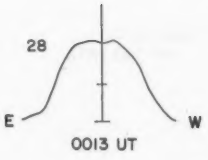


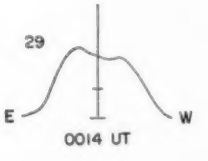
24
NO DATA

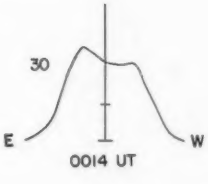
25
NO DATA

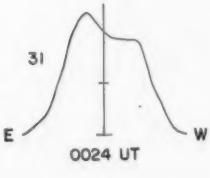
26
NO DATA











SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS

JANUARY 1978

JAN 1978	FREQUENCY	STATION	TYPE		STARTING TIME	TIME OF MAXIMUM	DURATION	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1}		INT	REMARKS
					UT	UT	MINUTES	PEAK	MEAN		
1	2800	OTTA	45	C	1502.3	1503	4.7	5	1.2		
	2800	OTTA	20	GRF	1520	1524	40	3.2	1.6		
	2800	OTTA	21	GRF	1615	1636	65	4.4	2		
	2800	OTTA	1	S	1634.5	1635.1	1.5	3.8	1.9		
	2695	BCUL	1	S	1636	1636.5	1	3	1		
	2800	OTTA	40	F	1735	1736.5	3	2.6			
	2800	OTTA	20	GRF	1800	1814	30	2.4	1.2		
	2800	OTTA	20	GRF	1845	1915	90	4	2		
	2695	BCUL	1	S	1943.5	1945.5	1.5	4	1		
	2695	PENT	20	GRF	2020	2030	60	1	0.5		
	2695	PENT	47	GB	2138.5	2152	48	650	145		
	2695	BCUL	47	GB	2139.5	2154	100 D	544	82		
	2800	OTTA	29	PBI	2226.5	2226.5	30	18			
2	8800	MANI	21	GRF	0701.8	0702.1	.8	131.2	40.2		
	8800	MANI	8	S	0702.3	0702.3	.1	1850	900		
	2695	MANI	3	S	0817.5	0817.8	.6	4	2		
	2800	OTTA	20	GRF	1552	1602	20	1.6	0.8		
	2800	OTTA	20	GRF	1725	1733	30	3.2	1.6		
	2800	OTTA	20	GRF	1920	1940	55	2	1		
	2695	BCUL	2	SF	1943.5	1944	1.5	4	1		
	2695	PENT	20	GRF	2022	2050	90	2.4	1.2		
3	2695	PENT	20	GRF	2044	2048	20	1.6	0.8		
4	8800	MANI	3	S	0254.5	0255	1	26.6	15.7		
	8800	MANI	3	S	0719.4	0720.4	4.1	37.2	11.2		
	2695	PENT	20	GRF	2045	2056	45	2	1		
5	2800	OTTA	8	S	1934.2	1934.5	0.8	2.6	1.3		
6	2800	OTTA	20	GRF	1650	1735	110	2.6	1.8		
7	8800	MANI	3	S	0305	0305.3	5.8	99.2	37.2		NT
	8800	MANI	3	S	0323.8	0326.2	2.7	24.8	14.9		
	2695	MANI	3	S	0323.8	0327.3	3.2	35	22.7		
	8800	MANI	47	GB	0633.6	0638.3	24.9	2250	1350		
	2695	BCUL	3	S	1844	1845	2.5	3	1		
	8800	SGMR	47	GB	1857	1929.7	63	761	228		CONT
	2800	OTTA	28	PRE	1858.5	1911.2	24.5	28	12.6		
	2695	SGMR	47	GB	1858.8	1929.8	77.2	607	182		CONT
	2695	BCUL	49	GB	1859.5	1931	87	619	33		
	2800	OTTA	47	GB	1923	1930	27	620	150		
	2800	OTTA	30	PBI	1950	1950	85	8.6	2.8		
	2800	OTTA	20	GRF	1954	1958	14	8.2	4.1		
8	8800	MANI	3	S	0001.8	0003.5	6.5	60.7	40.5		
	8800	MANI	21	GRF	0022.9	0025	10.2	161.9	45		I
	8800	MANI	8	S	0032.2	0032.3	.1	1050	500		
	8800	MANI	47	GB	0208.3	0212.8	11.8	810	506		IG
	8800	MANI	47	GB	0708	0713.8	18.5	986.7	658		
	2800	OTTA	240	R	1710	1713	3	2.8	1.4		
	2695	BCUL	45	C	1854.5	1911.5	25	64	21		
	2800	OTTA			1855	1903	12.5	68			
	2800	OTTA	46F	C	1855	1910.1	21	76	30		
	2695	SGMR	46	C	1856.3	1903.1	23.7	66.2	26.5		CONT
	2695	SGMR	46	C		1910.3		75.6			CONT
	8800	SGMR	4	S/F	1858	1902.8	21.5	63.7	25.5		CONT
	2800	OTTA			1907.5	1910.1	8.5	76			
	2800	OTTA	30	PBI	1916	1916	80	6.8	2.3		
	2800	OTTA	20	GRF	1940	1947	20	2.2	1.1		
11	2800	OTTA	20	GRF	1740	1815	80	1.4	0.7		
	8800	MANI	3	S	2239.9	2241.7	3.1	82.4	47.9		
	2695	MANI	3	S	2240	2241.7	3	16	9.2		
12	2800	OTTA	20	GRF	1500	1538	58	1.4	0.7		
	2800	OTTA	240	R	1927	1930	3	1.2	0.6		
13	2800	OTTA	27	RF	1755		120	1.4	1.3		
	2800	OTTA	24	R	1755	1805	10	1.4	0.7		
	2800	OTTA	24P	R	1805		100	1.4			
	2800	OTTA	26	FAL	1945	1955	10	-1.4	-0.7		
17	2800	OTTA	20	GRF	1352		130	5.4	2.7		
	2800	OTTA	8	S	1739.9	1740	0.6	1.6	0.8		
22	2800	OTTA	20	GRF	1430	1502	130	2.6	1.3		
	2800	OTTA	20	GRF	1645	1802	150	2	1		
24	2800	OTTA	20	GRF	1400	1445	140	3.8	1.9		
	2800	OTTA	21	GRF	1715	1720	30	2.2	1.1		
	2800	OTTA	1	S	1716	1717	2	2	1		
	2800	OTTA	27	RF	1845		105	1.2	0.9		

SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS
JANUARY 1978

JAN 1978	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} MEAN	INT	REMARKS
	2800	OTTA	24 R	1845	1915	30	1.2	0.6		
	2800	OTTA	24P R	1915		55	1.2			
	2800	OTTA	26 FAL	2010	2030	20	-1.2	-0.6		
	2695	PENT	32 ABS	2035	2110	55	-1.2	-0.6		
25	2695	MANI	3 S	0733	0733.2	.4	2.4	1.4		
	8800	MANI	3 S	0733.1	0733.2	.2	12	6		
	8800	MANI	3 S	0820	0820.4	.8	12	6		
	2695	MANI	3 S	0820	0820.6	.8	4.8	2.4		
	8800	MANI	3 S	0855.9	0856.2	.6	6	3		
	2800	OTTA	240 R	1510	1527	17	2	1		
	2800	OTTA	20 GRF	1538	1558	40	2	1		
	2800	OTTA	21 GRF	1636	1647	25	1.6			
	2800	OTTA	40 F	1644.5	1644.8	3	2.2			
	2800	OTTA	1 S	1945	1946	6	2.2	1		
26	2800	OTTA	20 GRF	1600	1612	40	1.8	0.9		
	2800	OTTA	20 GRF	1700	1800	130	1.8	1.2		
	2800	OTTA	240 R	1955	2030	35	1.8	0.9		
	2695	PENT	1 S	2311.5	2313	2.3	4	2		
	2695	BCUL	45 C	2312.5	2314	3.5	7	2		
27	2695	MANI	20 GRF	0330.6	0331.5	2.2	26.4	17.6		
	8800	MANI	20 GRF	0330.8	0331	1.4	66	44		
	2800	OTTA	1 S	1328	1329.5	3	4.6	1.6		
	2800	OTTA	20 GRF	1550	1605	45	3	1.4		
	2695	BCUL	23 GRF	2045.5	2046.5	12.5	3	1		
28	2800	OTTA	21 GRF	1420	1442	70	3.6	1.8		
	2800	OTTA	4 S/F	1507.2	1508	1.5	21	5.2		
	2800	OTTA	3 S	1522	1523	1	16.6	4.2		
	2800	OTTA	22 GRF	1610	1705	80	2.2	1.1		
	2800	OTTA	20 GRF	1940	2000	40	2.6			
29	2800	OTTA	23 GRF	1624	1642	60	2			
	2800	OTTA	1 S	1630.1	1630.9	1	1.4	0.7		
	2695	BCUL	8 S	1630.5	1631	1	4	1		
	2800	OTTA	8 S	1715.5	1715.7	0.5	1.4	1		
	2800	OTTA	20 GRF	2100	2102	33	3.4	1.7		
	2695	PENT	20 GRF	2140	2220	75	2.8	1.4		
30	2800	OTTA	1 S	1741	1742	2	0.8	0.4		
	2695	PENT	240 R	2102	2155	53	2.8	1.4		
31	2800	OTTA	1 S	1344	1345.2	4	3.6	1.8		
	2800	OTTA	27 RF	1357		73	2	1.8		
	2800	OTTA	24 R	1357	1403	6	2	1		
	2800	OTTA	24P R	1403		62	2			
	2800	OTTA	26 FAL	1505	1510	5	-2	-1		
	2800	OTTA	1A S	1635	1637.8	9	3	1.2		
	2800	OTTA	2 S/F	1635	1637.8	9	3	1.2		
	2695	BCUL	45 C	1635.5	1637.5	6.5	9	3		
	2800	OTTA	240 R	1750	1840	50	2.8	1.6		

Observatories:

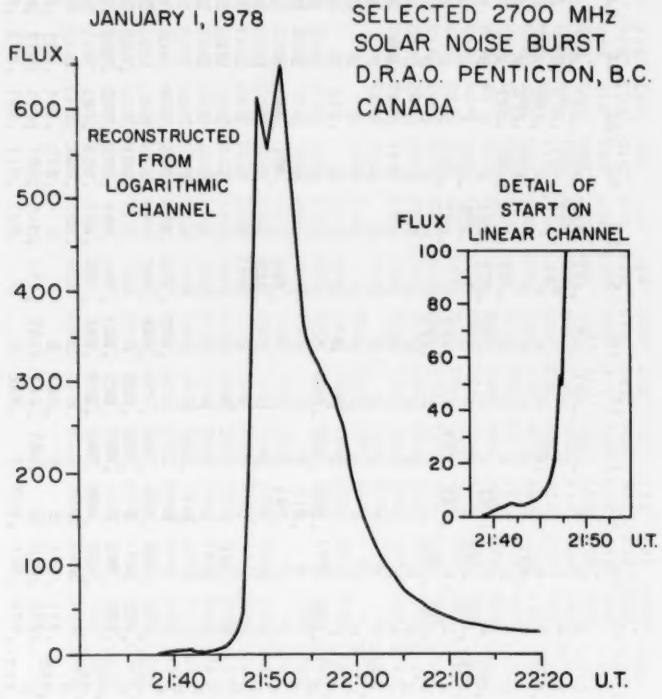
BOUL = Boulder MANI = Manila OTTA = Ottawa ARO PENT = Penticton SGMR = Sagamore Hill

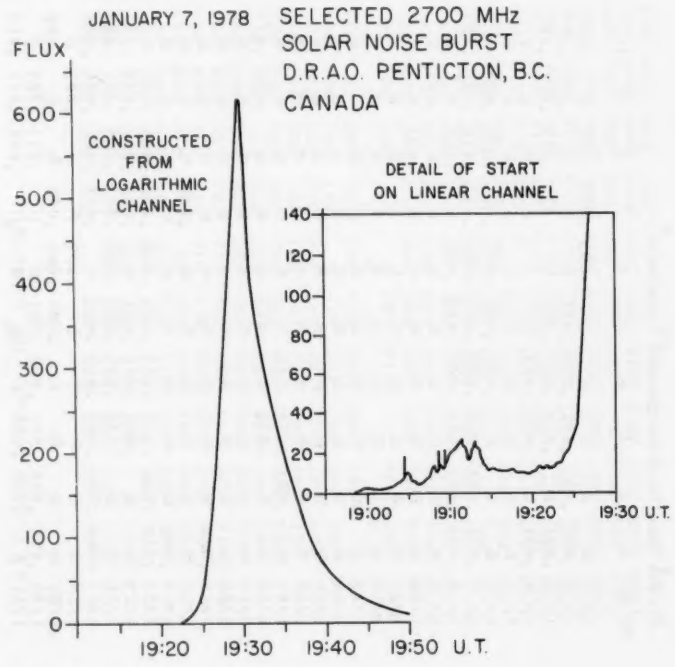
Explanation of Type Code:

1 Simple 1
2 Simple 1F
3 Simple 2
4 Simple 2F
5 Simple
6 Minor
7 Minor +
8 Spike
20 Simple 3
21 Simple 3A
22 Simple 3F
23 Simple 3AF
24 Rise
25 Rise A
26 Fall
27 Rise and Fall
28 Precursor
29 Post Burst Increase
30 Post Burst Increase A
31 Post Burst Decrease
32 Absorption
40 Fluctuation
41 Group of Bursts
42 Series of Bursts
43 Onset of Noise Storm
44 Noise Storm in Progress
45 Complex
46 Complex F
47 Great Burst
48 Major
49 Major +

SELECTED SOLAR NOISE BURSTS

1 - 7 JANUARY 1978





SOLAR X-RAYS BY SATELLITE
SMS GOES
JANUARY 1978

.5 - 4Å Hourly Averages (10^{-5} watts/m^2)

MO DA	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean
1/ 1	B	B	B	B	B	.009	.020	.002	B	.007	B	B	- B	B	B	.002	.001	.001	.001	.001	.007	.047	.040	.003	.006
1/ 2	.002	.002	.001	.003	.001	B	B	B	.043	.017	B	B	- B	B	B	B	B	B	B	.004	.001	.009	.003	.009	.004
1/ 3	.001	M	.016	.002	.003	B	.010	.015	.001	.003	.011	.002	- B	B	B	.001	B	B	B	B	.002	.002	B	.001	B
1/ 4	.001	B	.002	.001	B	B	B	B	B	B	B	B	- B	.001	B	B	B	B	B	B	.002	.002	.002	.001	.002
1/ 5	B	B	B	B	B	B	B	B	B	B	B	B	- B	B	B	B	B	B	.002	.002	.002	.001	.002	B	B
1/ 6	B	B	B	.002	.002	.002	.003	.003	.001	B	.003	.001	- B	B	.001	B	B	.001	.001	.001	B	B	B	.001	.001
1/ 7	.001	.007	.004	.025	.005	.004	.111	.110	.006	.001	B	.010	-.221	.003	B	B	B	B	B	.026	.003	B	B	B	.023
1/ 8	.003	.001	.216	.047	.009	.002	B	.625	B	B	B	B	- B	B	.004	.004	B	.001	B	.041	.001	B	B	B	.040
1/ 9	B	B	B	B	B	B	B	B	.001	B	B	B	-.037	.004	B	B	B	.008	B	B	B	B	B	B	.002
1/10	B	B	B	B	B	B	B	.001	B	B	B	B	- B	B	B	B	B	B	B	B	B	B	B	B	B
1/11	B	B	B	B	B	B	B	B	B	B	B	B	- B	B	B	B	B	B	B	B	B	B	.001	B	B
1/12	B	B	B	B	B	B	B	B	B	B	.014	.006	- M	M	M	B	B	B	B	B	B	B	B	B	.001
1/13	B	B	B	B	B	B	B	B	B	B	B	B	- B	B	B	B	B	B	B	B	B	B	B	B	B
1/14	B	B	B	B	B	B	B	B	B	B	B	.071	- B	B	B	B	B	B	B	B	B	.016	B	B	.004
1/15	B	B	B	B	B	B	B	B	B	B	B	B	-.006	B	.004	.006	.014	.001	B	B	B	B	B	B	.001
1/16	M	M	M	M	M	M	M	M	M	M	M	M	- M	M	.016	B	B	B	B	.043	B	B	B	B	.006
1/17	B	.001	.020	.001	B	B	B	B	B	B	B	B	- B	B	.003	B	B	B	.004	B	.011	.004	B	B	.002
1/18	B	B	.036	B	.019	B	B	B	.004	.014	B	B	- B	B	B	B	B	B	.013	B	B	B	B	B	.004
1/19	B	B	B	B	B	B	B	B	B	B	B	B	- B	B	B	B	B	B	B	B	B	B	B	B	B
1/20	B	B	B	B	B	B	B	B	B	B	B	B	- B	.001	B	B	B	B	B	B	B	B	B	B	B
1/21	.020	B	B	B	B	B	B	B	B	B	B	B	- B	B	B	B	B	B	B	B	B	B	B	B	.001
1/22	B	B	B	B	B	B	.002	B	B	B	B	B	- B	B	B	.001	B	B	B	B	B	B	B	B	B
1/23	.002	B	B	B	B	B	B	B	B	B	B	B	- B	B	B	B	B	B	B	B	B	B	B	B	B
1/24	.010	.036	.137	.273	.027	.052	.020	.005	.002	B	.002	.008	-.009	.003	.075	.209	.174	.011	.002	B	B	B	B	B	.044
1/25	B	B	.002	.001	.001	B	.002	.002	.008	.016	.006	B	-.003	B	B	.002	.002	B	B	B	.001	B	.002	B	.002
1/26	B	B	.004	.005	.002	.002	.003	.003	.001	.002	.003	.002	-.001	.002	B	.001	.001	.001	.001	.001	.003	.002	.002	.016	.003
1/27	.004	.002	.002	.015	.002	B	.001	.002	.004	.002	.008	.001	- B	.002	.005	.001	.010	.001	.002	.002	.001	.001	B	B	.003
1/28	B	B	B	B	B	.002	B	B	.001	B	B	B	- B	B	B	B	B	B	B	.001	.001	B	B	B	B
1/29	B	B	M	B	.002	.001	.001	B	B	.002	.002	.002	-.011	.001	B	B	.001	B	B	B	.019	.005	.025	.002	.003
1/30	.006	.006	.002	.002	.001	B	B	.014	.001	B	.001	B	-.036	.012	B	.007	.011	.152	.154	.046	.007	.054	.033	.013	.023
1/31	B	.002	.002	B	B	B	B	.002	.011	.016	B	.012	-.002	.001	.002	B	.002	B	B	.001	.011	.001	.003	.002	.003

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.

SOLAR X-RAYS BY SATELLITE
SMS GOES
JANUARY 1978

1 - 8Å Hourly Averages (10^{-4} watts/m^2)

MO DA	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Mean
1/ 1	.006	.005	.005	.005	.005	.011	.032	.008	.005	.016	.007	.006-	.006	.006	.006	.009	.007	.007	.008	.008	.006	.048	.072	.018	.010
1/ 2	.013	.011	.009	.012	.009	.006	.006	.006	.007	.006	.005	.006-	.005	.005	.005	.006	.005	.006	.005	.010	.008	.008	.012	.011	.006
1/ 3	.009	M	.027	.011	.007	.006	.008	.015	.006	.008	.022	.008-	.005	.005	.005	.006	.004	.005	.005	.005	.004	.007	.012	.006	.006
1/ 4	.006	.005	.007	.008	.005	.005	.005	.006	.007	.004	.006	.005-	.005	.007	.005	.006	.006	.006	.006	.006	.008	.009	.006	.008	.004
1/ 5	.005	.005	.005	.005	.004	.004	.005	.005	.004	.005	.006	.006-	.006	.005	.007	.006	.005	.006	.007	.007	.007	.007	.008	.007	.003
1/ 6	.006	.005	.006	.007	.007	.007	.009	.011	.009	.008	.010	.008-	.006	.005	.006	.005	.005	.008	.007	.006	.006	.005	.006	.006	.004
1/ 7	.006	.017	.015	.036	.017	.012	.075	.131	.025	.009	.005	.017-	.161	.025	.005	.004	.004	.004	.004	.033	.025	.005	.004	.003	.025
1/ 8	.016	.006	.177	.067	.022	.010	.004	.330	.006	.002	.002	.002-	.002	.002	.002	.002	.002	.005	.004	.056	.007	.003	.002	.002	.035
1/ 9	.002	.002	.002	.002	.002	.002	.002	.002	.006	.002	.002	.003-	.048	.016	.005	.003	.003	.009	.003	.002	.002	.002	.002	.002	.004
1/10	.002	.002	.002	.003	.003	.002	.002	.005	.002	.002	.002	.002-	.002	.001	.002	.002	.002	.002	.002	.002	.002	.002	.004	.004	.001
1/11	.003	.002	.002	.003	.002	.002	.002	.002	.002	.002	.002	.001-	.002	.002	.001	.001	.001	.002	.002	.003	.002	.002	.003	.003	.001
1/12	.001	.001	.001	.001	.001	.001	.001	.002	.001	.001	.015	.040-	M	M	M	.002	.001	.002	.002	.002	.002	.002	.002	.002	.003
1/13	.003	.002	.002	.004	.003	.002	.002	.001	.002	.003	.002	.002-	.001	B	B	B	B	.001	.001	.002	.002	.001	.002	.001	B
1/14	.001	.002	.001	.001	.001	B	.001	.001	.001	.001	.001	.005-	.001	.001	.002	.001	.001	.001	.002	.003	.003	.014	.001	B	.003
1/15	B	.001	.002	.003	.003	.003	.002	.002	.002	.002	.001	.001-	.001	.002	.003	.001	.003	.001	.001	.020	B	B	B	B	.002
1/16	M	M	M	M	M	M	M	M	M	M	M	M	- M	M	.014	.001	.005	.002	B	.004	.001	B	B	B	.005
1/17	.001	.004	B	.014	.003	B	B	.001	.002	.002	.002	.001-	B	.003	.009	.001	B	B	.003	B	.002	.002	B	.002	.002
1/18	.010	.001	.003	.003	.003	.002	.002	.002	.005	.002	.002	.001-	.001	.001	.001	.001	.001	.002	.019	.001	.002	.002	.001	.001	.003
1/19	.001	.001	.002	.002	.002	.003	.002	.002	.002	.002	.003	.002-	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.002	.001
1/20	.002	.002	.002	.002	.002	.002	.002	.002	.003	.003	.002	.002-	.002	.003	.002	.003	.003	.002	.002	.002	.002	.003	.003	.003	.001
1/21	.003	.002	.002	.002	.002	.003	.002	.002	.003	.003	.002	.002-	.002	.002	.002	.002	.002	.002	.002	.002	.002	.003	.003	.002	.002
1/22	.002	.002	.002	.003	.003	.003	.005	.003	.002	.002	.003	.003-	.003	.002	.002	.004	.003	.004	.003	.002	.003	.004	.003	.006	.002
1/23	.005	.002	.003	.003	.003	.003	.003	.005	.002	.002	.002	.002-	.002	.002	.002	.002	.005	.020	.187	.543	.478	.100	.028	.055	.042
1/24	.030	.145	.379	.795	.093	.135	.052	.018	.012	.008	.008	.028-	.024	.010	.187	.484	.394	.019	.004	.004	.003	.003	.003	.004	.091
1/25	.004	.005	.008	.009	.006	.005	.007	.014	.040	.052	.027	.008-	.007	.005	.005	.010	.011	.007	.005	.005	.008	.006	.008	.006	.007
1/26	.005	.006	.014	.022	.014	.012	.015	.018	.010	.011	.016	.012-	.009	.010	.008	.008	.010	.009	.008	.008	.011	.009	.009	.032	.007
1/27	.018	.010	.009	.023	.010	.007	.007	.008	.011	.012	.019	.010-	.007	.009	.014	.009	.022	.009	.010	.009	.007	.008	.007	.006	.007
1/28	.008	.007	.006	.006	.008	.009	.007	.006	.008	.006	.007	.007-	.006	.005	.007	.006	.006	.006	.006	.007	.008	.005	.006	.005	.004
1/29	.005	.005	M	.006	.009	.009	.009	.006	.006	.008	.011	.011-	.012	.011	.009	.009	.010	.008	.008	.007	.006	.010	.008	.010	.006
1/30	.010	.017	.014	.010	.009	.008	.007	.009	.013	.008	.009	.009-	.009	.013	.006	.026	.008	.045	.021	.028	.012	.023	.026	.013	.019
1/31	.007	.010	.010	.008	.008	.007	.007	.012	.010	.010	.007	.023-	.009	.010	.011	.009	.012	.008	.007	.008	.008	.007	.016	.010	.007

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.

SOLAR X-RAYS BY SATELLITE

GOES

JANUARY 1978

DAY	BEGIN TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}	MAX TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}	1/2P TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}
1	0510	5.7E-09	5.1E-07	0515	1.1E-07	1.9E-06	0518	2.3E-08	9.7E-07
1	0551	1.7E-08	7.3E-07	0600	1.5E-06	1.2E-05	0610	4.5E-07	5.7E-06
1	0722	3.1E-09	4.6E-07	0732	5.0E-08	1.7E-06	0739	2.8E-08	9.9E-07
1	0917	7.8E-09	5.9E-07	0922	6.0E-07	5.6E-06	0931	1.1E-07	3.0E-06
1	1630	1.4E-08	6.9E-07	1636	4.5E-08	1.2E-06	1642	1.7E-08	9.4E-07
1	2142	1.5E-08	8.0E-07	2155	2.6E-06	2.7E-05	2209	8.5E-07	1.3E-05
2	0111	4.6E-08	1.4E-06	0114	9.0E-08	2.0E-06	0116	2.9E-08	1.5E-06
2	0342	2.6E-08	1.2E-06	0350	1.2E-07	2.2E-06	0357	2.9E-08	1.7E-06
2	1912	5.2E-09	4.6E-07	1924	9.7E-08	1.8E-06	1928	3.7E-08	1.0E-06
2	1934	4.1E-08	1.0E-06	1940	1.1E-07	1.8E-06	1947	5.5E-08	1.4E-06
2	2103	2.9E-08	1.0E-06	2106	4.3E-06	1.5E-06	2108	2.6E-08	1.1E-06
2	2231	3.6E-08	1.1E-06	2246	5.1E-08	1.8E-06	2305	2.8E-08	1.4E-06
3	0220	2.9E-08	1.2E-06	0239	4.9E-07	6.1E-06	0248	1.2E-07	3.4E-06
3	0352	1.0E-08	6.7E-07	0404	4.0E-07	1.2E-06	0407	1.4E-08	7.3E-07
3	0645	2.1E-08	8.5E-07	0649	7.2E-08	1.9E-06	0654	5.0E-08	1.3E-06
3	0727	6.5E-09	5.9E-07	0743	4.2E-07	4.3E-06	0752	1.1E-07	2.4E-06
3	0928	6.4E-09	5.2E-07	0932	1.2E-07	2.0E-06	0939	3.6E-08	1.1E-06
3	1014	1.1E-08	7.3E-07	1025	5.6E-07	7.5E-06	1032	1.5E-07	4.1E-06
3	1524	2.8E-09	4.4E-07	1527	8.4E-08	1.6E-06	1531	3.5E-08	9.1E-07
3	2228	6.6E-09	5.7E-07	2238	1.8E-07	2.6E-06	2252	3.2E-08	1.5E-06
4	0252	9.2E-09	6.8E-07	0259	1.6E-07	2.7E-06	0304	3.9E-08	1.6E-06
4	0716	6.6E-09	5.5E-07	0720	9.6E-08	1.7E-06	0724	2.9E-08	1.1E-06
4	2052	4.2E-08	1.1E-06	2055	5.6E-08	2.0E-06	2058	5.3E-08	1.4E-06
5	1352	0.0E+00	5.0E-07	1407	2.7E-08	1.0E-06	1420	5.8E-09	7.5E-07
6	0659	6.9E-08	1.2E-06	0702	8.4E-08	1.8E-06	0706	6.9E-08	1.4E-06
6	0959	1.2E-08	7.4E-07	1005	9.1E-08	1.7E-06	1018	3.2E-08	1.2E-06
6	1425	2.2E-09	4.6E-07	1433	5.0E-08	1.0E-06	1448	9.8E-09	7.3E-07
6	2307	6.0E-09	5.0E-07	2312	6.7E-08	1.1E-06	2317	2.0E-08	8.1E-07
7	0040	1.9E-08	7.2E-07	0043	4.9E-08	1.0E-06	0045	2.6E-08	8.7E-07
7	0123	2.8E-08	8.5E-07	0145	1.2E-07	3.0E-06	0213	5.0E-08	1.9E-06
7	0301	1.9E-08	1.0E-06	0316	4.4E-07	4.8E-06	0354	1.1E-07	2.9E-06
7	0632	1.3E-07	2.4E-06	0659	2.9E-06	2.3E-05	0726	1.0E-06	1.3E-05
7	1103	1.8E-08	7.3E-07	1114	1.2E-07	2.0E-06	1130	4.9E-08	1.3E-06
7	1149	1.1E-07	1.9E-06	1229	3.8E-06	2.4E-05	1251	9.4E-07	1.3E-05
7	1912	6.0E-08	1.2E-06	1949	4.8E-07	6.1E-06	2015	1.1E-07	3.5E-06
7	2359	3.7E-09	4.0E-07	0017	1.3E-07	2.6E-06	0039	5.1E-08	1.5E-06
8	0200	4.4E-08	9.9E-07	0235	3.1E-06	2.6E-05	0257	1.2E-06	1.3E-05
8	0705	2.9E-09	3.8E-07	0716	2.7E-05	1.2E-04	0727	7.2E-06	5.5E-05
8	1856	1.0E-08	4.3E-07	1919	7.6E-07	3.4E-06	1949	1.8E-07	4.3E-06
8	1213	2.0E-09	3.0E-07	1233	1.6E-06	1.8E-05	1243	6.1E-07	9.4E-06

SOLAR X-RAYS BY SATELLITE

GOES

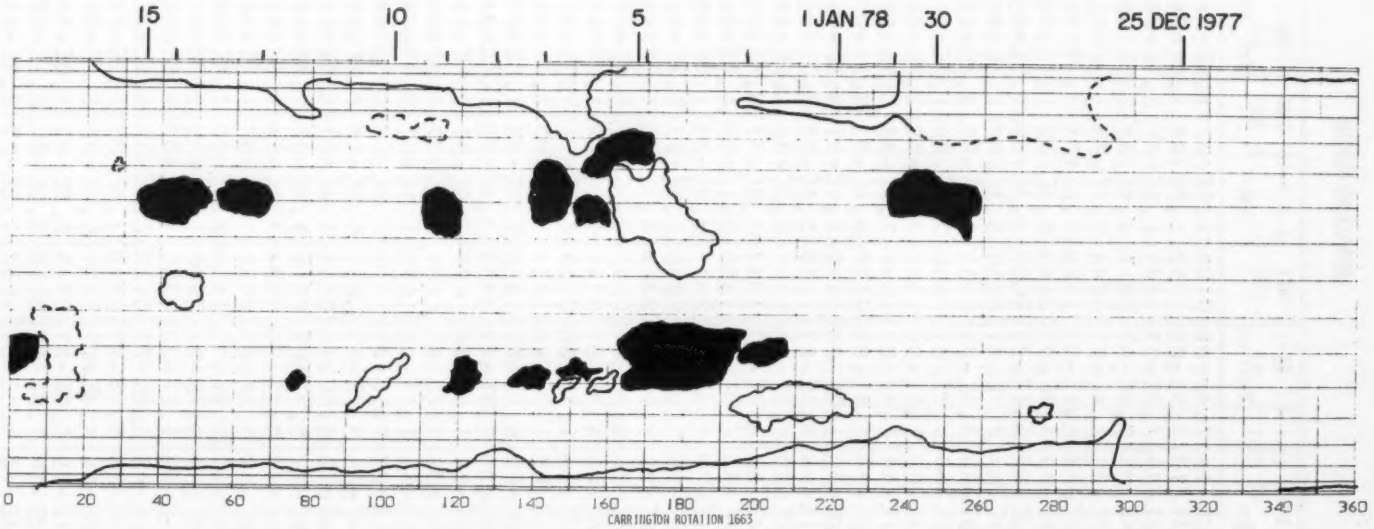
JANUARY 1978

DAY	BEGIN TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}	MAX TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}	1/2P TIME	.5-4A Wm^{-2}	1-8A Wm^{-2}
17	0121	2.6E-10	7.4E-08	0129	1.0E-07	1.6E-06	0137	1.9E-08	8.0E-07
17	1029	1.3E-10	9.9E-08	1052	1.0E-08	1.6E-06	1054	2.6E-09	2.1E-07
17	1351	7.8E-09	3.0E-07	1405	1.2E-07	2.5E-06	1416	3.4E-08	1.4E-06
20	2205	2.5E-09	2.5E-07	2211	4.9E-08	1.0E-06	2216	1.1E-08	5.7E-07
22	0635	2.8E-09	2.4E-07	0644	8.4E-08	1.3E-06	0702	1.8E-08	6.7E-07
24	1722	1.2E-08	6.1E-07	1726	5.2E-08	1.1E-06	1728	2.6E-08	8.4E-07
25	0144	3.5E-09	3.7E-07	0149	6.6E-08	1.1E-06	0154	1.8E-08	7.5E-07
25	0223	2.6E-08	8.1E-07	0228	4.3E-08	1.2E-06	0233	2.1E-08	1.0E-06
25	0250	1.7E-08	7.7E-07	0258	3.3E-08	1.3E-06	0307	2.1E-08	1.0E-06
25	0430	4.8E-09	4.5E-07	0435	1.0E-07	1.6E-06	0438	4.4E-08	1.0E-06
25	0626	5.0E-09	4.2E-07	0632	7.6E-08	1.3E-06	0640	2.6E-08	8.9E-07
25	1538	2.4E-08	1.2E-06	1541	4.7E-08	1.7E-06	1543	3.7E-08	1.4E-06
25	1637	1.1E-08	7.8E-07	1641	5.7E-08	1.7E-06	1657	2.3E-08	1.2E-06
26	0203	1.5E-08	8.0E-07	0327	9.4E-08	2.8E-06	0346	2.3E-08	1.8E-06
26	1009	1.6E-08	1.2E-06	1015	1.1E-07	2.6E-06	1019	3.2E-08	1.9E-06
26	1127	9.1E-09	9.5E-07	1130	5.3E-08	2.0E-06	1134	3.8E-08	1.5E-06
26	1234	7.6E-09	7.3E-07	1237	3.3E-08	1.2E-06	1239	1.2E-08	9.1E-07
26	1338	1.6E-08	9.1E-07	1347	1.0E-07	2.3E-06	1353	2.5E-08	1.5E-06
26	1850	8.6E-09	6.8E-07	1855	5.1E-08	1.3E-06	1859	2.1E-08	9.5E-07
26	2027	8.1E-09	7.4E-07	2035	7.0E-08	1.5E-06	2037	2.3E-08	1.0E-06
26	2044	2.0E-08	9.5E-07	2050	1.5E-07	2.4E-06	2056	3.8E-08	1.6E-06
27	0050	1.0E-08	9.2E-07	0054	3.7E-08	1.4E-06	0104	1.9E-08	1.1E-06
27	0327	5.3E-09	6.5E-07	0335	8.5E-07	7.4E-06	0344	1.9E-07	4.0E-06
27	0738	8.6E-09	6.3E-07	0743	5.1E-08	1.2E-06	0750	1.9E-08	8.9E-07
27	0848	5.7E-08	1.5E-06	0855	1.3E-07	2.7E-06	0902	4.8E-08	1.9E-06
27	1027	5.3E-08	1.7E-06	1036	5.0E-07	5.7E-06	1040	1.3E-07	3.6E-06
27	1322	1.0E-08	6.9E-07	1326	7.0E-08	1.8E-06	1336	2.9E-08	1.2E-06
27	1353	9.0E-09	7.7E-07	1357	4.4E-08	1.2E-06	1403	2.1E-08	9.6E-07
27	1417	8.8E-08	1.7E-06	1420	2.6E-07	3.5E-06	1426	9.7E-08	2.4E-06
27	1547	7.7E-09	7.6E-07	1604	7.6E-07	6.8E-06	1609	1.3E-07	3.4E-06
27	1855	2.8E-08	1.1E-06	1858	1.1E-07	2.0E-06	1901	3.7E-08	1.5E-06
27	1914	1.1E-08	7.3E-07	1917	8.1E-08	1.5E-06	1919	3.2E-08	1.0E-06
27	2043	6.4E-09	5.7E-07	2051	5.3E-08	1.3E-06	2057	1.6E-08	9.2E-07
28	0540	1.4E-08	8.5E-07	0545	1.0E-07	1.9E-06	0551	3.2E-08	1.3E-06
28	0809	8.8E-09	5.9E-07	0815	5.8E-08	1.4E-06	0821	1.9E-08	9.7E-07
28	1957	1.5E-08	9.2E-07	2001	4.4E-08	1.3E-06	2006	2.7E-08	1.1E-06
29	0938	3.3E-09	5.4E-07	0943	5.7E-08	1.2E-06	0959	1.6E-08	8.6E-07
29	1628	4.9E-09	8.0E-07	1633	2.9E-08	1.6E-06	1641	1.9E-08	1.2E-06
29	2237	4.7E-09	6.7E-07	2240	1.5E-05	1.2E-06	2242	4.7E-09	6.6E-07
29	2334	4.1E-08	1.2E-06	2337	4.3E-08	1.7E-06	2339	3.7E-08	1.3E-06
30	0134	1.1E-08	6.9E-07	0148	2.1E-07	4.1E-06	0206	4.0E-08	2.3E-06
30	1937	1.4E-06	5.8E-07	1940	1.5E-07	1.1E-06	1942	6.0E-09	6.1E-07
30	2323	5.2E-09	6.4E-07	2327	6.0E-08	1.6E-06	2332	1.6E-08	8.1E-07
30	2340	6.1E-09	6.8E-07	2345	2.6E-08	1.0E-06	2353	1.3E-08	8.4E-07
31	0659	1.2E-08	7.8E-07	0710	8.9E-08	2.2E-06	0718	1.6E-08	1.4E-06
31	1229	1.4E-10	5.5E-07	1236	1.2E-07	2.2E-06	1243	3.4E-08	1.3E-06
31	1326	2.0E-08	1.1E-06	1330	1.0E-07	2.1E-06	1332	3.6E-08	1.6E-06
31	1405	3.2E-08	1.2E-06	1408	4.3E-08	2.1E-06	1410	3.8E-08	1.4E-06
31	2301	9.4E-09	7.3E-07	2306	1.2E-07	2.0E-06	2313	3.9E-08	1.3E-06

HELIUM 10830Å SYNOPTIC MAPS

CARRINGTON ROTATION 1663

KITT PEAK NATIONAL OBSERVATORY



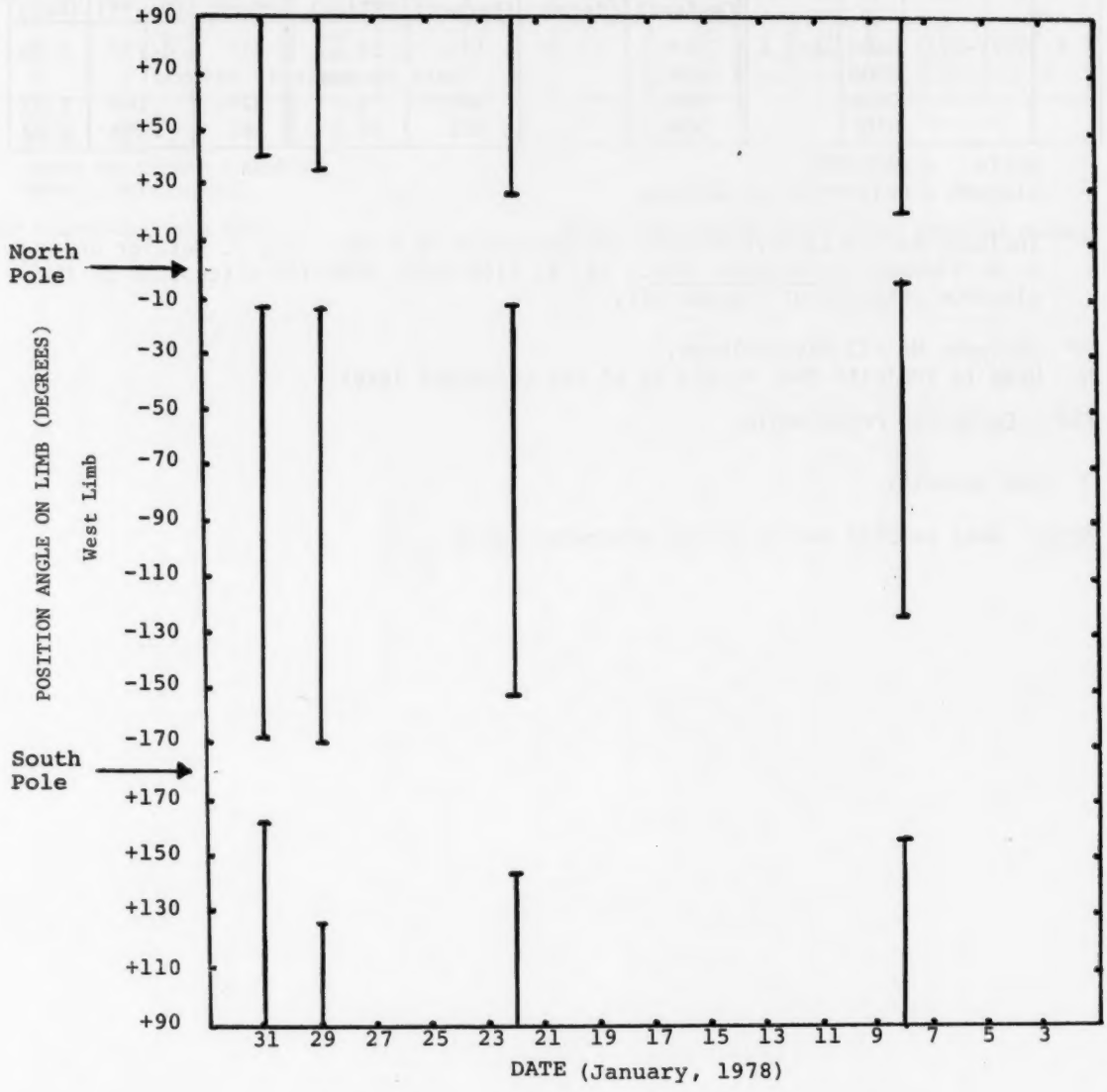
CORONAL HOLES

Helium D3 Chromosphere at Solar Limb

JANUARY 1978

Big Bear Solar Observatory

OBSERVATIONS OF D3 CHROMOSPHERE AT SOLAR LIMB



PIONEER VI

JANUARY 1978

Date Jan. 1978	DSN Coverage (UT)	Data Time (UT)	ESP (°)	SOLAR WIND AMES[1] U_{H^+} (km/sec)	SOLAR WIND AMES[1] TAU (days)	SOLAR WIND MIT[2] U_{H^+} (km/sec)	SOLAR WIND MIT[2] N_{H^+} (H^+/cc)	COSMIC RAY PROTONS[3] (particles/sec) 6-13 (Mev*)	13-175 (Mev**)	>175 (Mev)
6	0325-0737	0400	-024.4	448.	-1.72	479.	12.4	312	0.177	1.26
		0500		506.		data excessively noisy				
		0600		506.		509.	9.5	375.	.166	1.22
		0700		506.		475.	10.3	361.	.163	1.22

[1] Wolfe - NASA/ARC
[2] Simpson - University of Chicago

* Includes He 0.6-13 Mev/nucleons and electrons ∿0.5 Mev - see J. Retzler and J. A. Simpson, J. Geophys. Res., 74, 9, 2149-2160, 1969 for discussion of the electron response of Pioneer VII.

** Includes He >13 Mev/nucleons.
Q Used to indicate that a rate is at its quiescent level.

ESP = Earth-Sun Probe Angle.

† Peak velocity.

Note: Data sampled hourly unless otherwise noted.

PIONEER IX

JANUARY 1978

Date Jan. 1978	DSN Coverage (UT)	Data Time (UT)	ESP (°)	SOLAR WIND[1]				IP E-FIELD[2]	IMF[3]		COSMIC RAY PROTONS[4] (particles/sec)	
				U_{H^+} (km/sec)	N_{H^+} (H^+/cc)	T_{H^+} (x10^{6}°K)	TAU (days)	400 Hz (mv)	|B| (γ)	φ (°)	>13.9 Mev	>40 Mev
17	0607-1024	0600	-14.16	325.			-0.43	0.234	18.5	079.	7.01	0.729
		0700		325.				.258	16.1	106.	7.03	1.39
		0800		303.				.251	16.2	128.	7.2	1.3
		0900		314.				.214	15.4	099.	7.15	1.18
		1000		314.				.155	16.5	106.	6.99	1.16

[1] Wolfe - NASA/ARC
[2] Scarf - TRW, Inc.
[3] Sonett and Colburn - NASA/ARC
[4] Webber - Univ. of N.H.

ESP = Earth-Sun Probe Angle.

Note: Data sampled hourly unless otherwise noted.

INFERRED IP MAGNETIC FIELD

BARTELS ROTATION	DATE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1955	JUL 20		T*								TA A*									AT T*	TA TA	TA -	TA TA					
1956	AUG 16							TA T*								*		AT			-	AT -	AT -	AT -	TA -	-	-	-
1957	SEP 12	-	-	AT -	-	-	-	-	-	-	-	AT -	-	AT -	AT -	-	AT -	-	-	-	-			AT		-		
1958	OCT 9	AT *	A*		A*		*				TA	A*			*	-	-	-	*		TA	AT	AT	-			AT	
1959	NOV 5	AT	TA			TA		T*		*	AT *		-		*	-											*	
1960	DEC 2							TA		*						AT		*					- *			-	TA -	
1961	DEC 29	-	AT -	*	*	*			AT				*			*	A*		*	*			*					AT
1962	1977 JAN 25			-			-	-	TA -		A*			AT -			*	-			*	-				TA		
1963	FEB 21	AT	-	-	-	-	TA		TA			*									-			-				
1964	MAR 20		TA		AT					*			-	-						A*				-				
1965	APR 16			TA		TA -	AT	TA		TA		AT				-	-	TA		AT AT				TA				AT
1966	MAY 13	TA	-	-		TA			TA											AT	- -	AT T*	- T*				AT AT	-
1967	JUN 9								TA		-			TA						AT A*					AT *	A*		TA TA
1968	JUL 6										A*			T*	TA	TA		T*			AT			-	AT		-	
1969	AUG 2		TA						TA	-			TA	*								AT	TA					
1970	AUG 29			-	-	-		TA										AT	AT			AT	TA	TA -	AT	AT		
1971	SEP 25						-	-	-	-	-	-					TA				TA							
1972	OCT 22					-	AT														AT AT					*		
1973	NOV 18			TA	AT						-		AT							*			*		*			
1974	DEC 15				-	-	-		AT -		AT				AT	AT		AT		TA		TA		TA			*	
1975	1978 JAN 11		*	*					*		*	*						*			TA	-						

▨ = definitely towards the sun □ = definitely away from the sun

T = towards the sun A = away from the sun * = effect doubtful or not discernible - = missing data

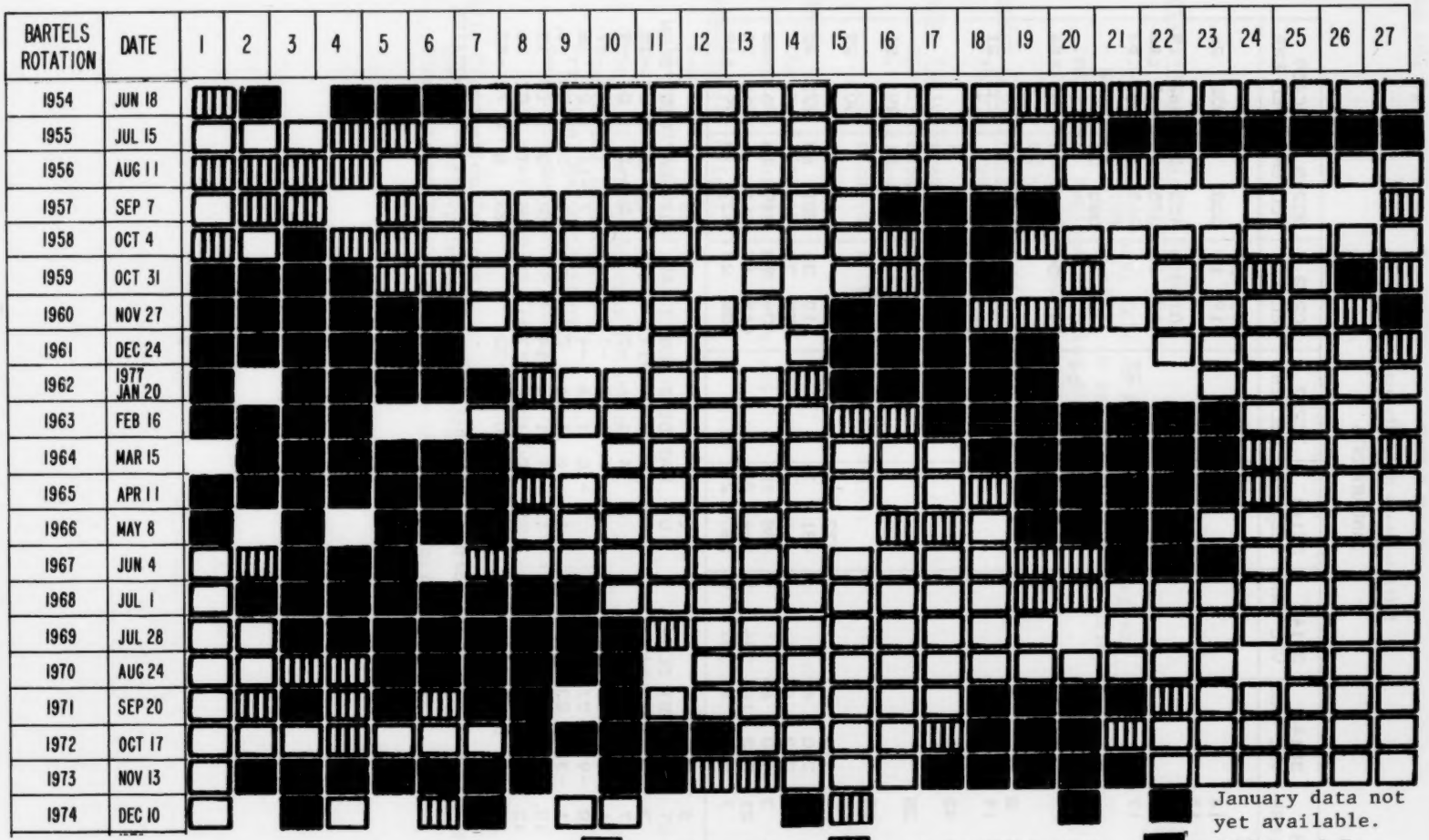
The table shows daily inferences of the polarity of the interplanetary magnetic field. The first half of the day is based principally on magnetograms produced by the magnetometer at the Vostok Antarctic Station of the USSR. The magnetometer of the U.S. Air Weather Service now operated at Thule by the Danish Meteorological Institute is used for the second half of the day.

Note: The Bartels Rotation numbers after Rotation number 1955 were incorrect in this Table in SGD issues 385 Part I through 389 Part I.

Errata: Thule data for December 5, 6, 10, 11, 12 and 19, 1976 have been corrected.

The table shows daily inferences of the polarity of the interplanetary magnetic field. The first half of the day is based principally on magnetograms produced by the magnetometer at the Vostok Antarctic Station of the USSR. The magnetometer of the U.S. Air Weather Service now operated at Thule by the Danish Meteorological Institute is used for the second half of the day.
Note: The Bartels Rotation numbers after Rotation number 1955 were incorrect in this Table in SGD issues 385 Part I through 389 Part I.
Errata: Thule data for December 5, 6, 10, 11, 12 and 19, 1976 have been corrected.

STANFORD MEAN SOLAR MAGNETIC FIELD



January data not yet available.

POLARITY OF THE MEAN SOLAR MAGNETIC FIELD: □ = FIELD >2μT, ▥ = -2μT ≤FIELD ≤2μT, ■ = FIELD <-2μT

No box visible indicates no data available for that day.

Note: Data are taken daily at 2000 UT. Dates given are not Bartels Rotation dates. These earlier dates correspond to the occurrence of phenomena on the sun which affect the Earth during the given Bartels Rotation.

SOLAR WIND

Interplanetary Scintillations

JANUARY 1978

DAY	3C48 VEL	ERR	3C144 VEL	ERR	3C147 VEL	ERR	3C161 VEL	ERR	3C237 VEL	ERR	3C273 VEL	ERR	3C298 VEL	ERR	3C459 VEL	ERR
1											395	30				
2	330	14									519	12	302	6	332	26
3	319	15														
4	423	15									601	6	453	55	562	15
5	501	44									467	13	395	13	619	16
6	568	17							622	27			365	8	689	53
7													407	68		
9											478	17	385	30		
10	282	20							342	54						
12											345	39	288	42	286	54
13													280	22		
14	350	8											379	15		
15	237	14													233	21
18											339	6			277	*
19	263	45									285	62	333	4		
20											334	5	292	4		
21	280	28									360	4	237	15		
23											275	6	315	21	294	89
24	309	38														
25															303	29
26			394	18			473	11					285	15		
27			290	4			431	7			410	36	281	63	273	40
28			253	6							375	72				
29	293	3	450	6			488	18			436	80	249	16	267	38
30	506	21	332	18	386	7	564	20			469	69	461	6	366	74
31	398	7	489	8	357	9	580	27			388	23	437	5	391	119

JANUARY	5				15				25			
	UT	LAT	DIST	DLON	UT	LAT	DIST	DLON	UT	LAT	DIST	DLON
3C48	3.	3.	1.13	-13.	2.	2.	1.09	-14.	1.	1.	1.04	-15.
3C144	7.	-3.	1.28	-5.	6.	-4.	1.26	-7.	5.	-5.	1.24	-9.
3C147	6.	2.	1.26	-3.	5.	2.	1.25	-5.	4.	1.	1.23	-7.
3C161	8.	-9.	1.27	-2.	7.	-10.	1.26	-4.	7.	-11.	1.25	-6.
3C237	11.	-5.	1.23	10.	11.	-6.	1.26	8.	10.	-6.	1.28	6.
3C273	13.	-3.	1.09	16.	13.	-4.	1.14	14.	12.	-5.	1.18	13.
3C298	15.	0.	0.97	17.	15.	0.	1.02	17.	14.	-1.	1.07	16.
3C459	24.	2.	0.91	-23.	23.	4.	0.83	-33.	23.	6.	0.72	-42.

*Denotes data for which no error estimate is available since only two antennas were operating.

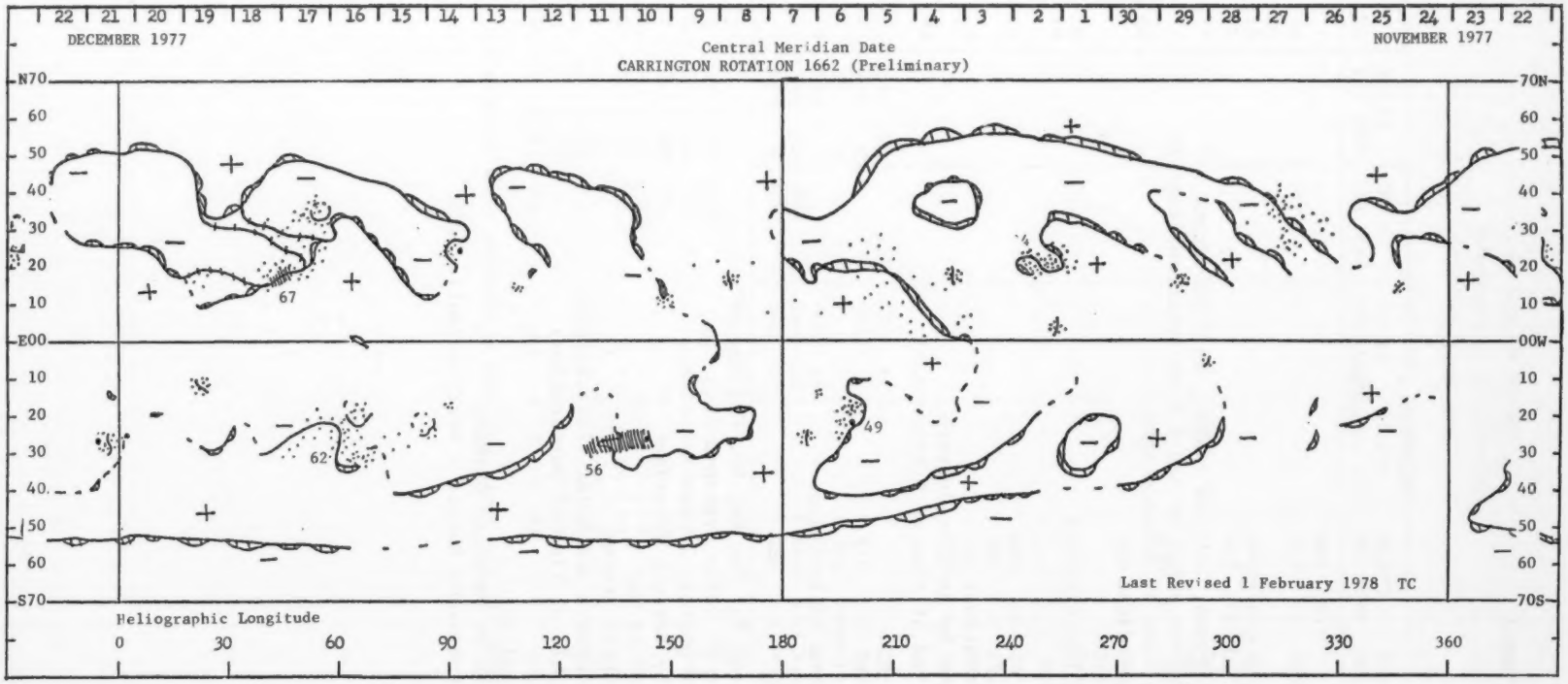
DECEMBER 1977 DATA

Contents

	Page
Daily Solar Activity Center	
Hα Synoptic Chart	36-37
X-ray, Magnetograms, Calcium Plages, Hα Filtergrams, Sunspots, Corona and 2 cm and 8.6 mm Spectroheliograms	38-99
Individual Regions of Solar Activity	100-105
Daily Calcium Indices	105
Sudden Ionospheric Disturbances	
Table of Events	106-107
Solar Radio Waves	
Spectral Observations	108-119
Selected Events by Radioheliograph (not received at time of publication)	
Cosmic Rays	
Chart of Variations	120-123
Neutron Monitors Daily Values	124
Geomagnetic Indices	
Table of Indices Kp, Kn, Ks, Km, Cp, Ap, aa	125
12-Month Table of Daily Averages Ap	126
Chart of Kp by Bartels 27-day Rotation	127
Chart of Dst by Bartels Rotation	128
Equatorial Indices Dst	129
Principal Magnetic Storms	130
Sudden Commencements and Solar Flare Effects (not available at time of publication)	
Radio Propagation Indices	
Quality Indices on Paths to Germany	131
Transmission Frequency Ranges - North Atlantic Path	132-133

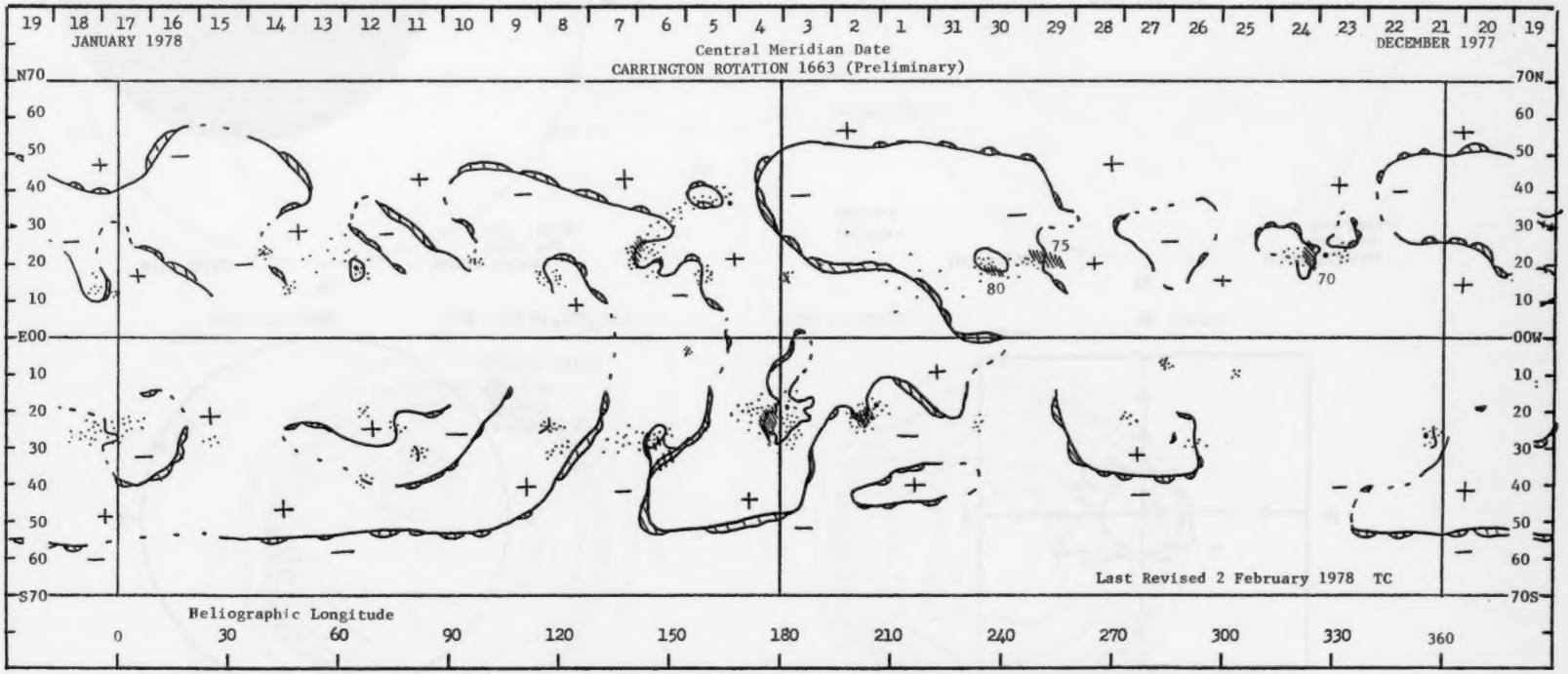
Hα SYNOPTIC CHART

CARRINGTON ROTATION 1662 (PRELIMINARY)

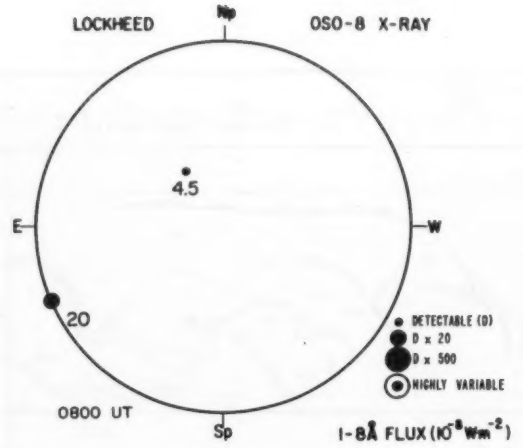


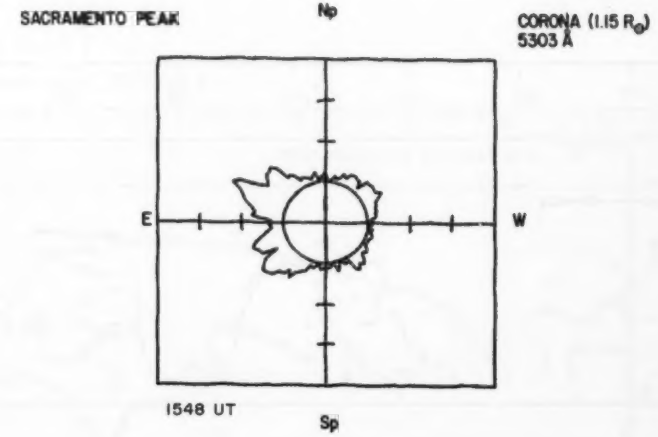
Hα SYNOPTIC CHART

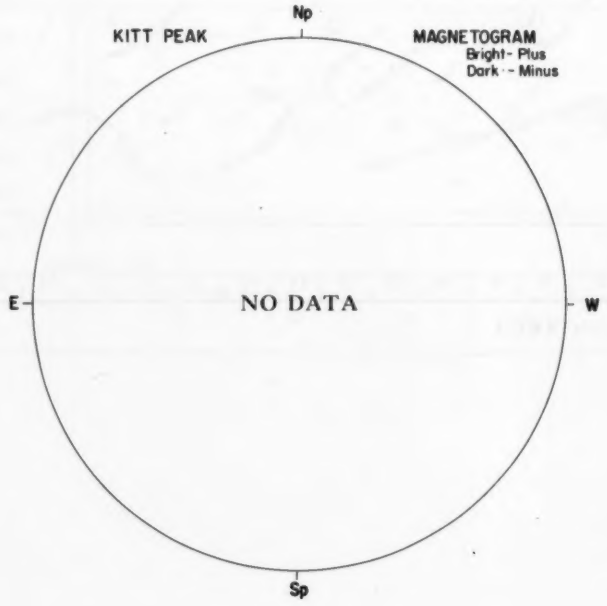
CARRINGTON ROTATION 1663 (PRELIMINARY)

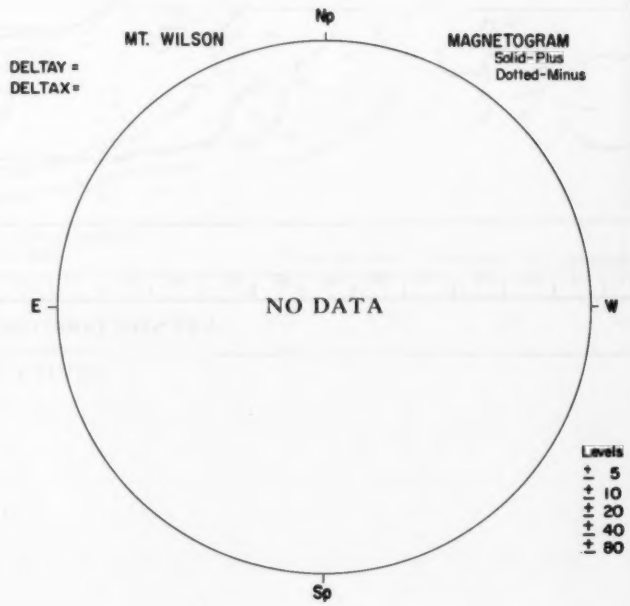


DECEMBER 1, 1977 (P = 16.16, B_o = 0.85, L_o = 268.73)









Sp

Sp

01

SACRAMENTO PEAK

Np

Hα

E

W

2219 UT

Sp

BOULDER

Np

SUNSPOTS

E

W

069

1545 UT

Sp

PROMINENCES

1533 UT

McMATH-HULBERT

Np

CALCIUM REPORT

E

NO DATA

W

Sp

NOSC LA POSTA

2.0 CM

Np

E

W

Sp

1933 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

8.6 MM

Np

E

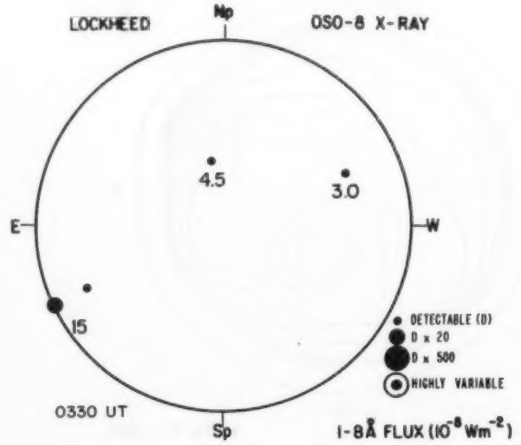
W

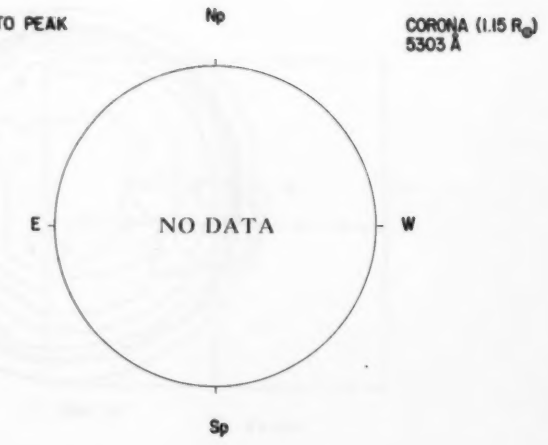
Sp

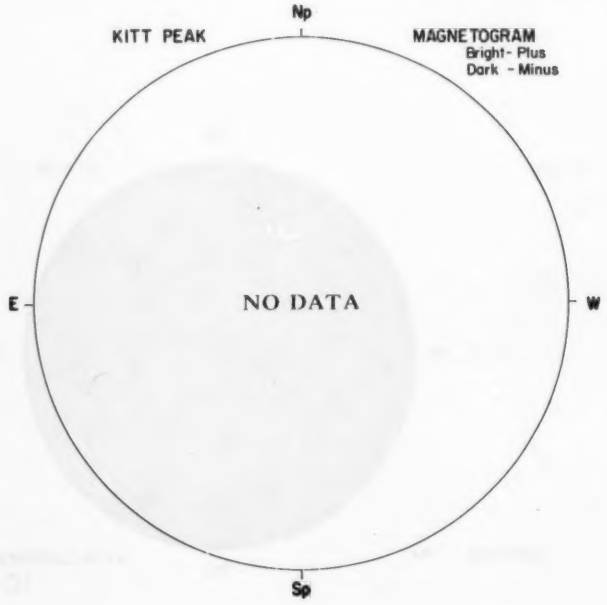
1835 UT

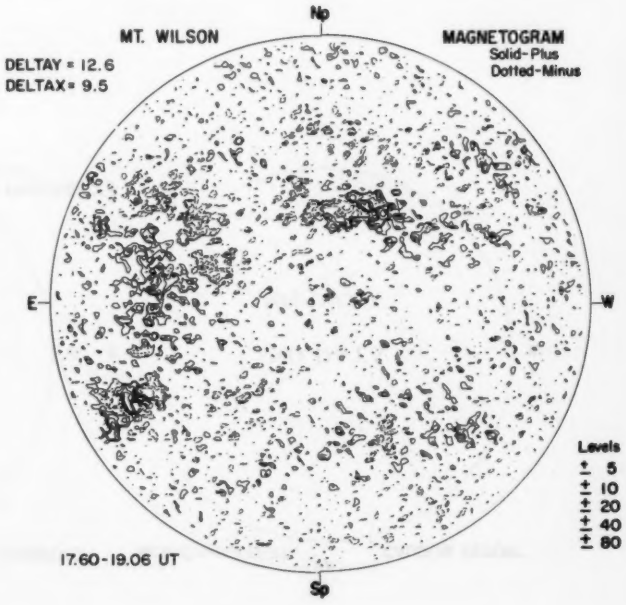
Ant. Temp. Unit 100°K

DECEMBER 2, 1977 (P = 15.77, B_0 = 0.73, L_0 = 255.55)



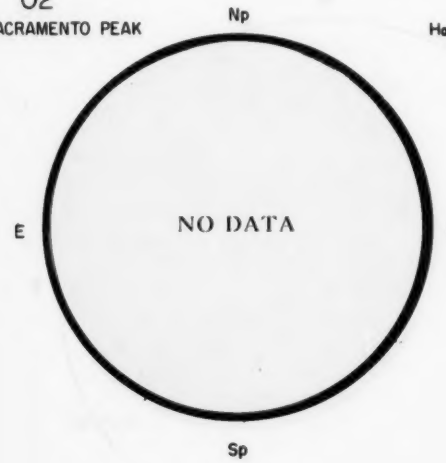




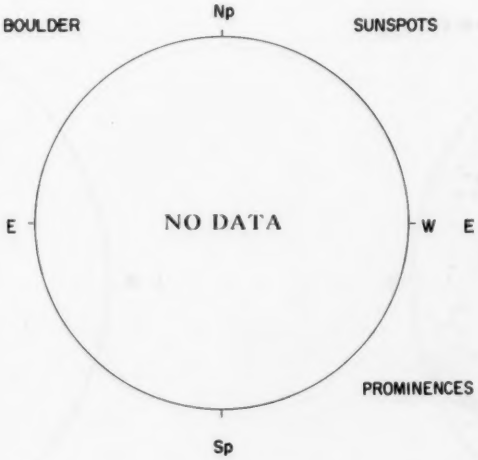


02

SACRAMENTO PEAK



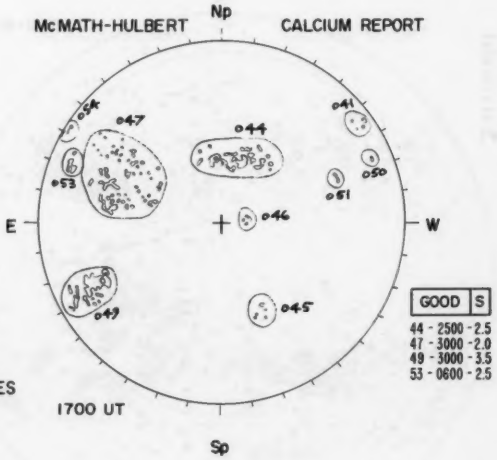
Hα BOULDER



SUNSPOTS

McMATH-HULBERT

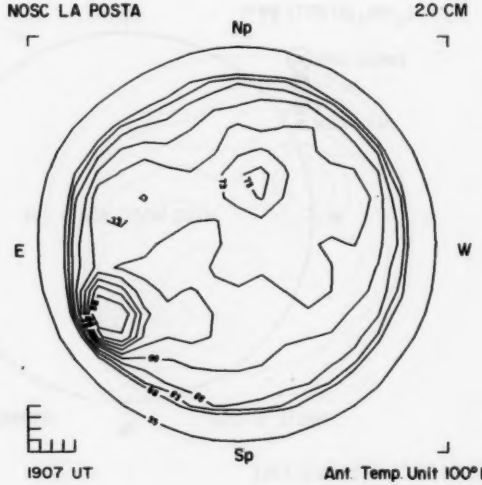
CALCIUM REPORT



PROMINENCES

1700 UT

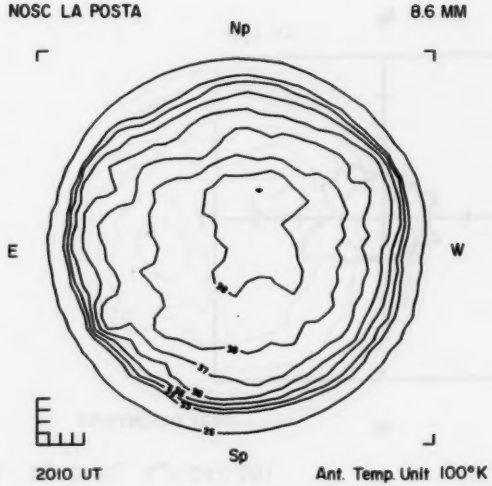
NOSC LA POSTA 2.0 CM



1907 UT

Ant. Temp. Unit 100°K

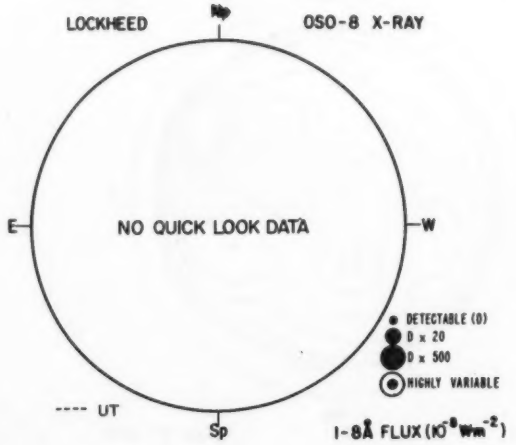
NOSC LA POSTA 8.6 MM

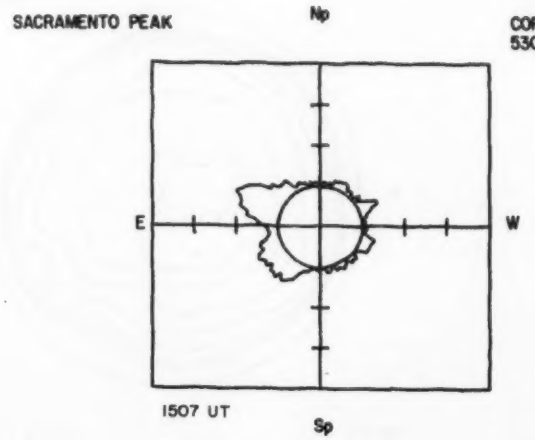


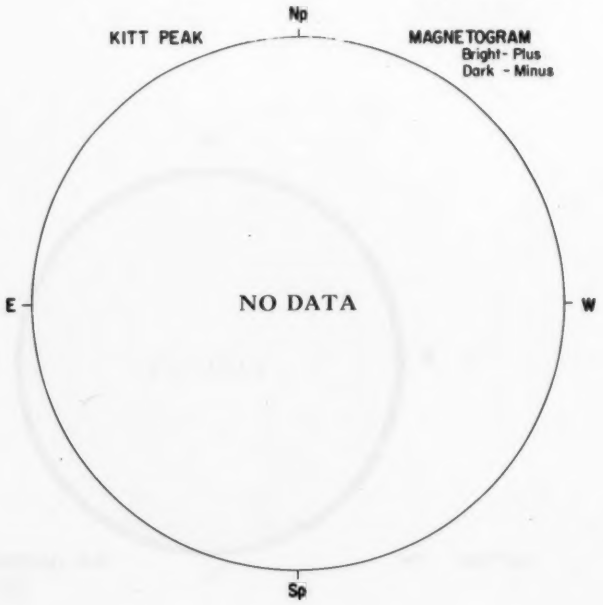
2010 UT

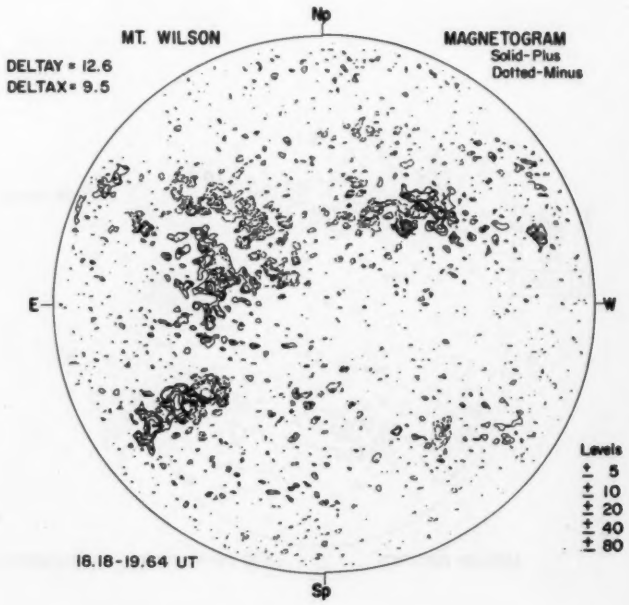
Ant. Temp. Unit 100°K

DECEMBER 3, 1977 (P = 15.38, B_0 = 0.60, L_0 = 242.38)



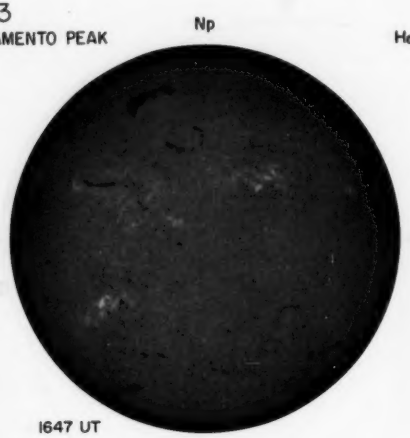






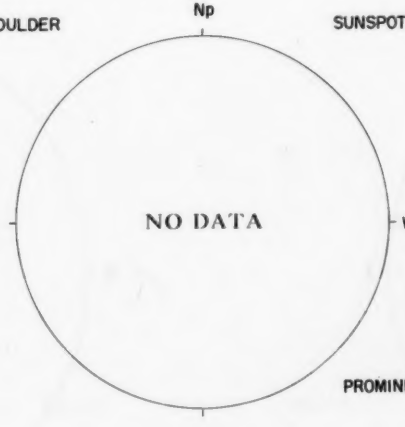
03

SACRAMENTO PEAK



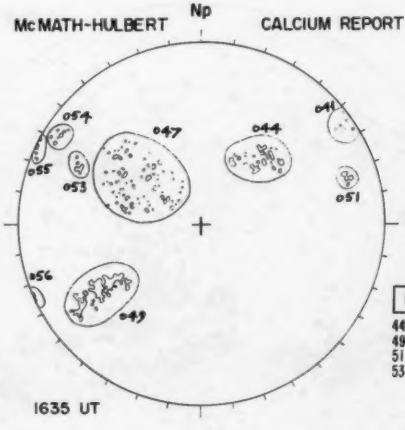
1647 UT

Hα BOULDER



SUNSPOTS

McMATH-HULBERT



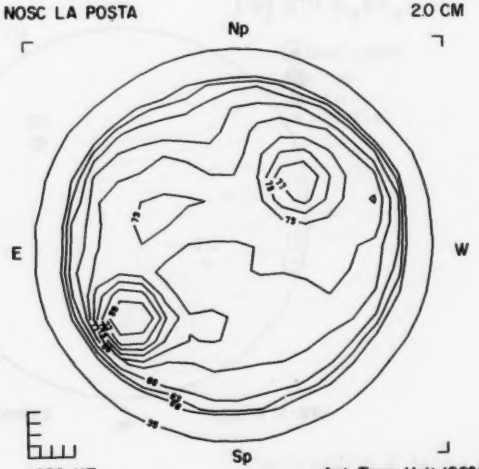
1635 UT

CALCIUM REPORT

FAIR	M
44 - 2100 - 3.0	
49 - 3300 - 3.5	
51 - 0500 - 2.5	
53 - 0500 - 2.5	

PROMINENCES

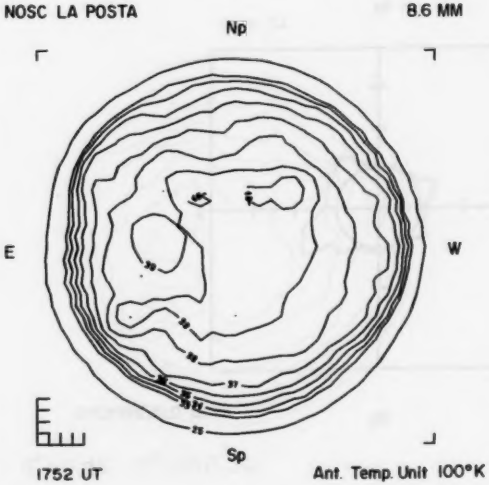
NOSC LA POSTA 2.0 CM



1856 UT

Ant. Temp. Unit 100°K

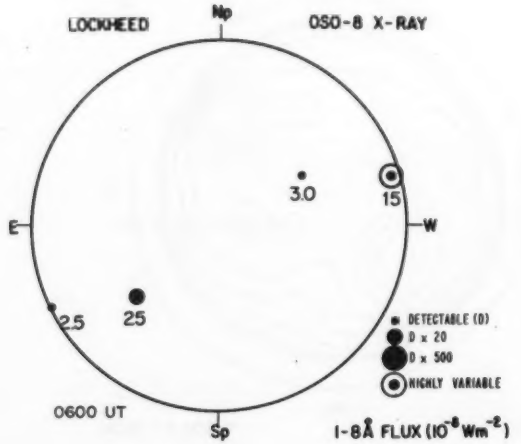
NOSC LA POSTA 8.6 MM

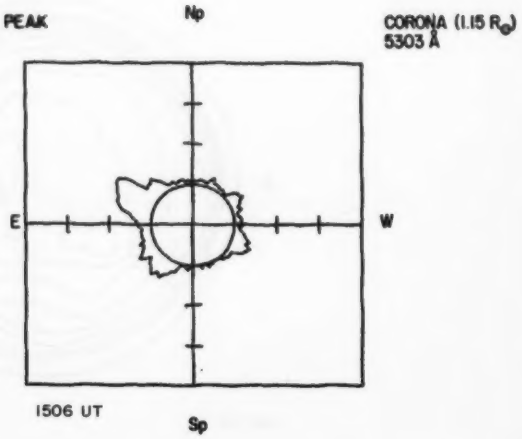


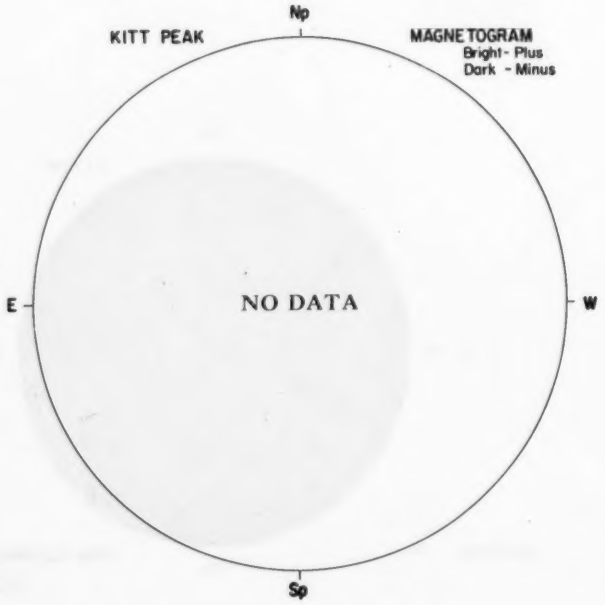
1752 UT

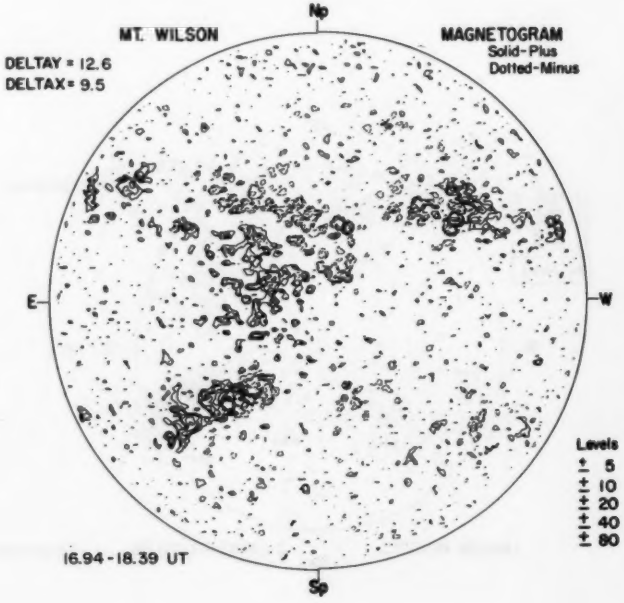
Ant. Temp. Unit 100°K

DECEMBER 4, 1977 (P = 14.98, B_o = 0.47, L_o = 229.20)



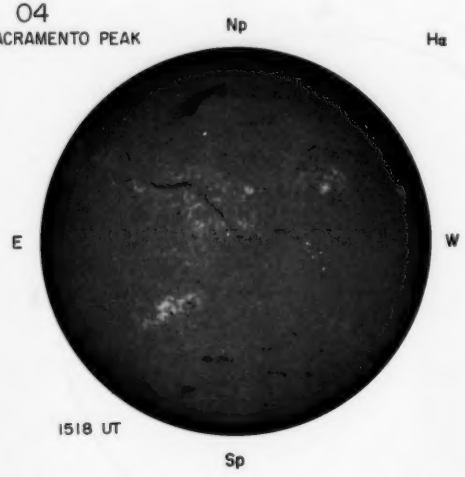






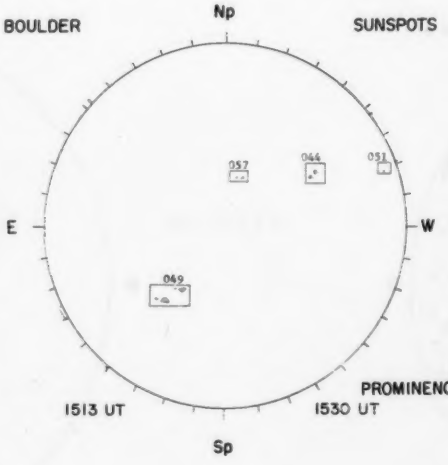
04

SACRAMENTO PEAK



1518 UT

Hα BOULDER

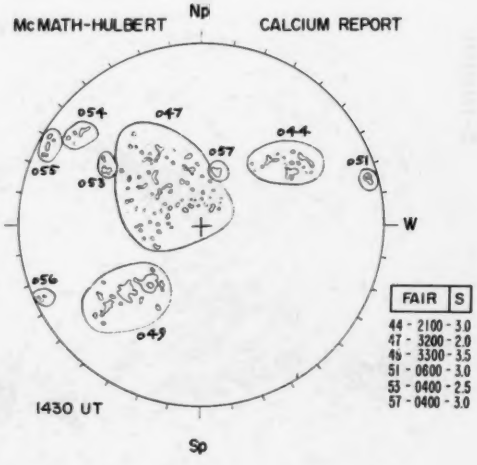


1513 UT 1530 UT

SUNSPOTS

PROMINENCES

McMATH-HULBERT



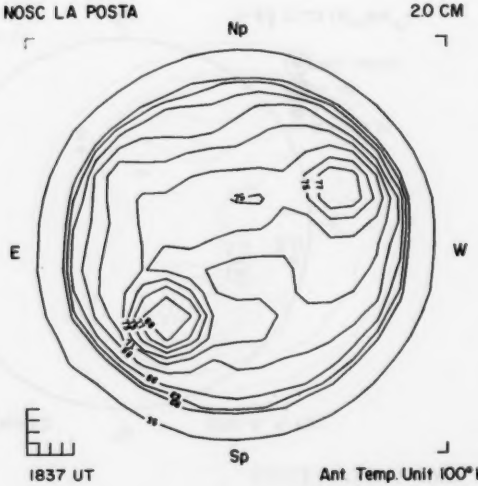
1430 UT

CALCIUM REPORT

FAIR	S

44 - 2100 - 3.0
47 - 3200 - 2.0
49 - 3300 - 3.5
51 - 0600 - 3.0
53 - 0400 - 2.5
57 - 0400 - 3.0

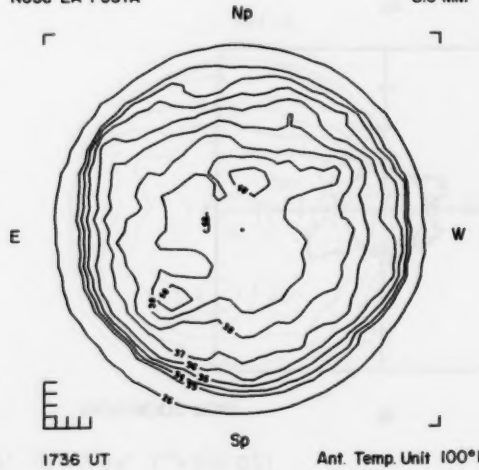
NOSC LA POSTA 2.0 CM



1837 UT

Ant. Temp. Unit 100°K

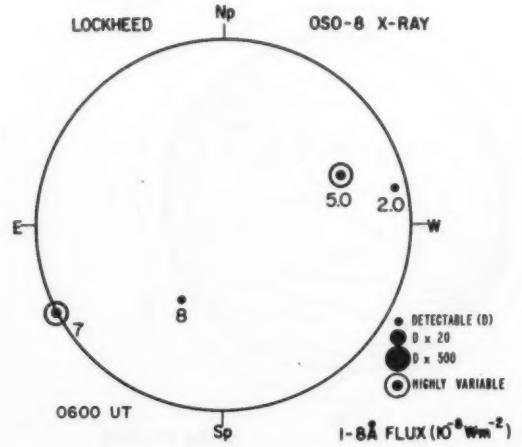
NOSC LA POSTA 8.6 MM

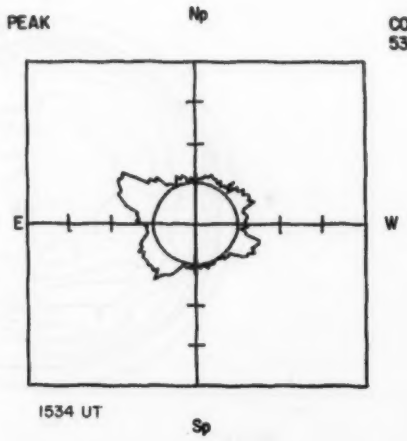


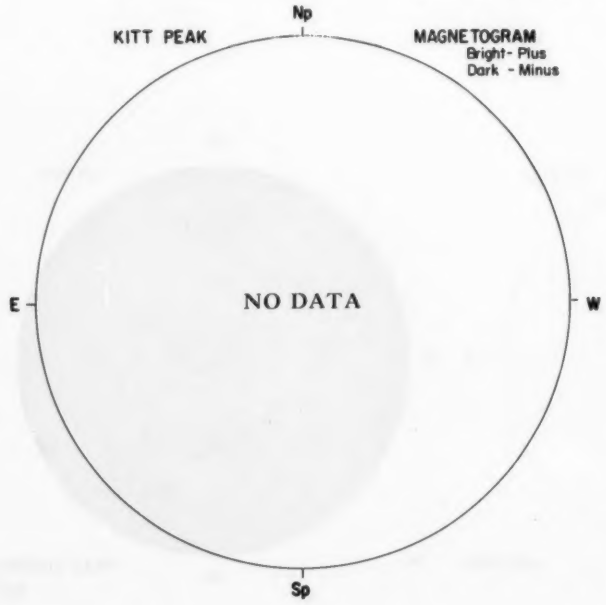
1736 UT

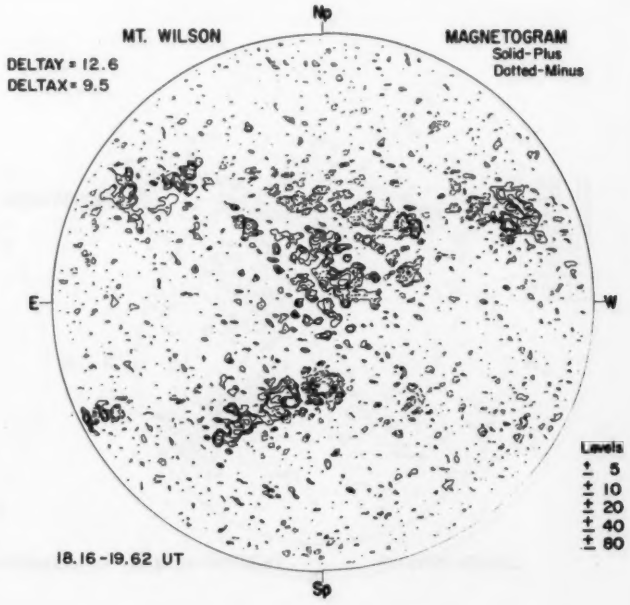
Ant. Temp. Unit 100°K

DECEMBER 5, 1977 (P = 14.57, B_o = 0.34, L_o = 216.02)



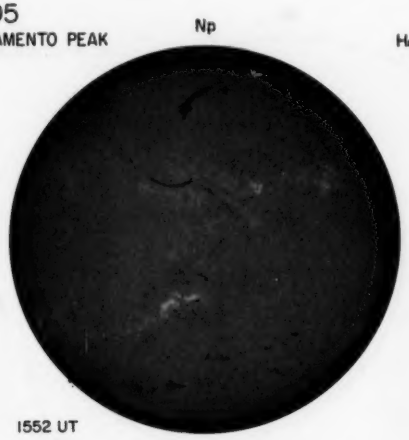






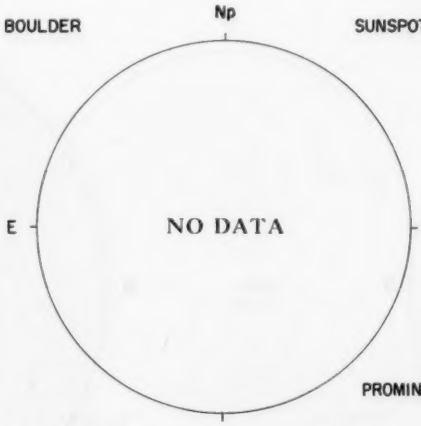
05

SACRAMENTO PEAK



1552 UT

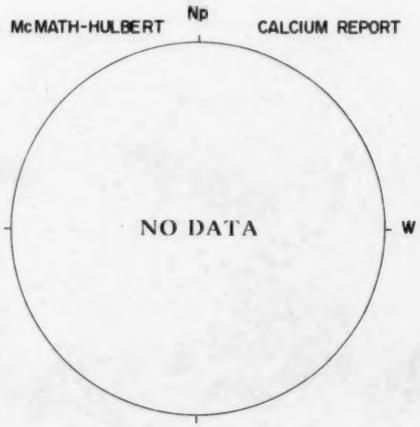
Hα BOULDER



SUNSPOTS

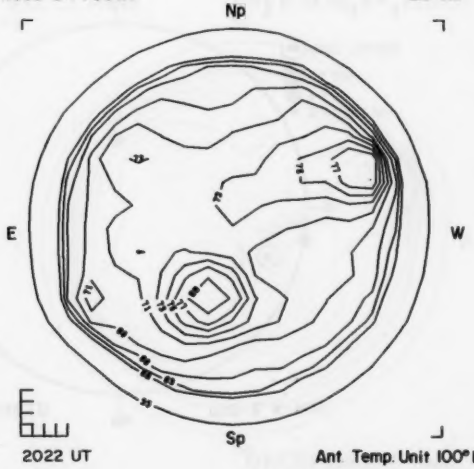
PROMINENCES

McMATH-HULBERT



CALCIUM REPORT

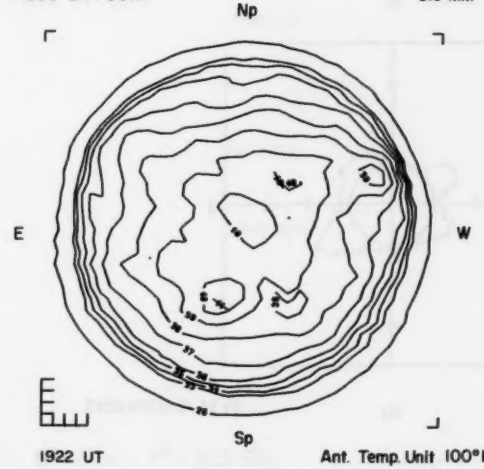
NOSC LA POSTA 2.0 CM



2022 UT

Ant. Temp. Unit 100°K

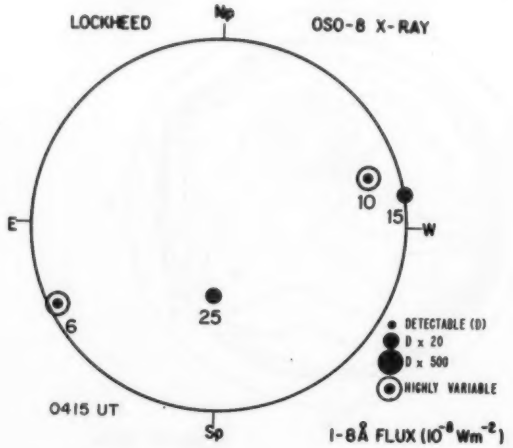
NOSC LA POSTA 8.6 MM

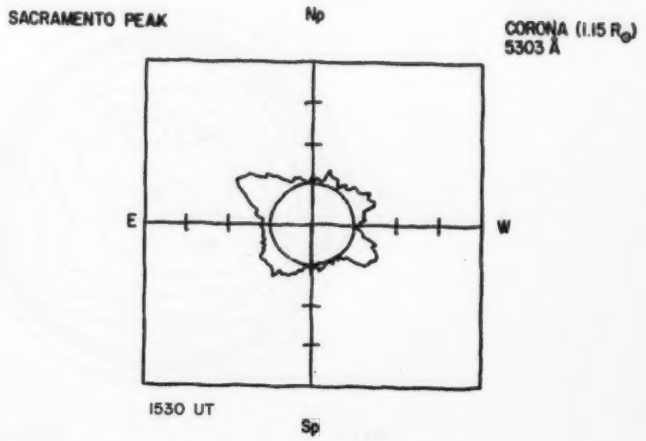


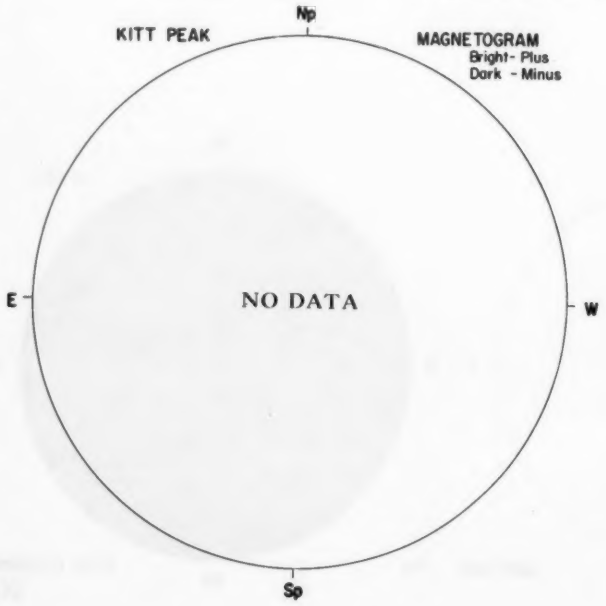
1922 UT

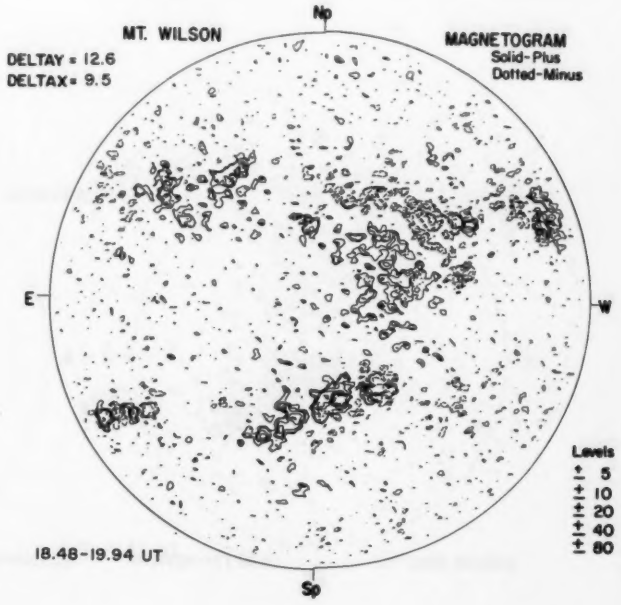
Ant. Temp. Unit 100°K

DECEMBER 6, 1977 (P = 14.16, B_o = 0.21, L_o = 202.84)



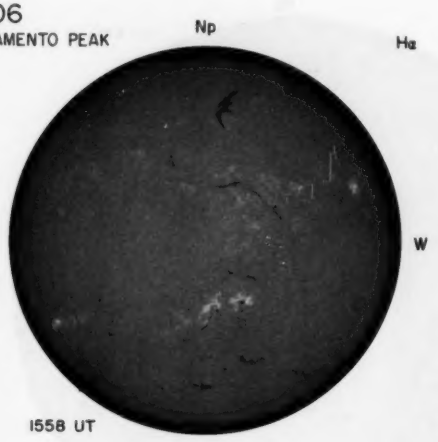






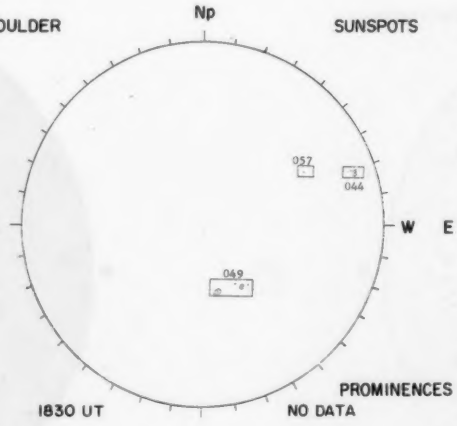
06

SACRAMENTO PEAK



1558 UT

Hα BOULDER



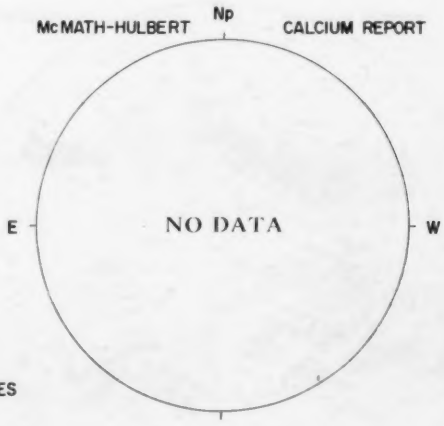
1830 UT

SUNSPOTS

PROMINENCES

NO DATA

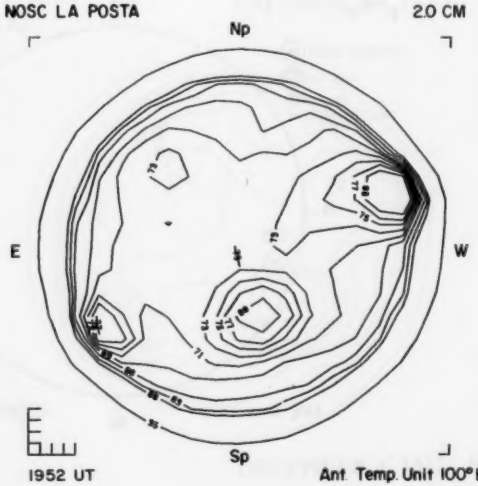
McMATH-HULBERT



CALCIUM REPORT

NOSC LA POSTA

2.0 CM



1952 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

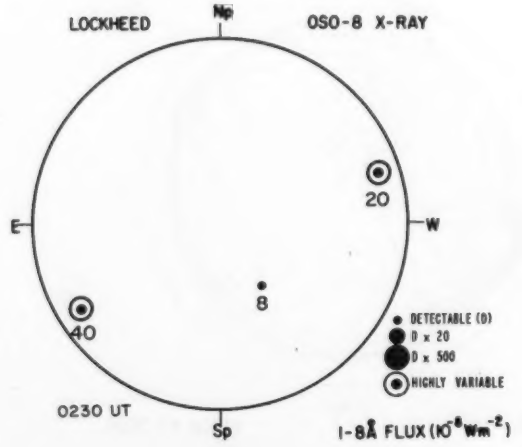
8.6 MM

---- UT

Ant. Temp. Unit 100°K

DECEMBER 7, 1977 (P = 13.75, B_0 = 0.09, L_0 = 189.67)

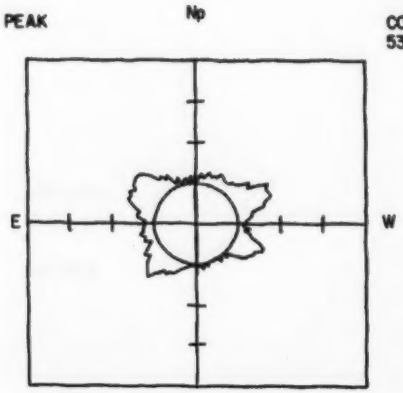
LOCKHEED OSO-8 X-RAY



0230 UT

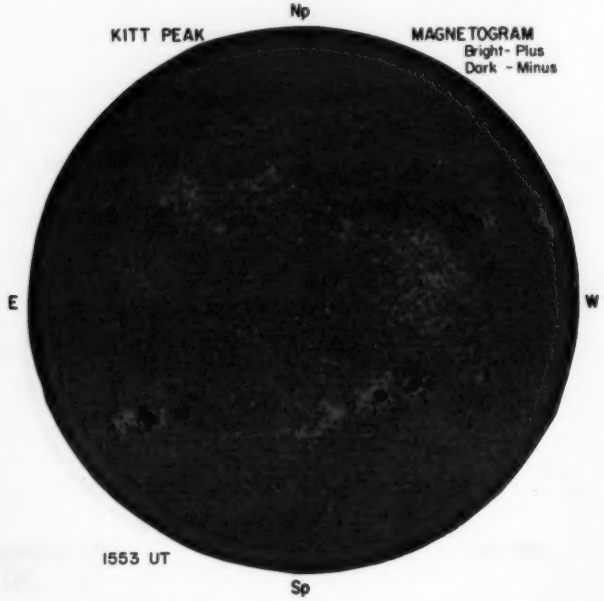
1-8Å FLUX ($K^0 Wm^{-2}$)

SACRAMENTO PEAK CORONA (1.15 $R_\odot$) 5303 Å



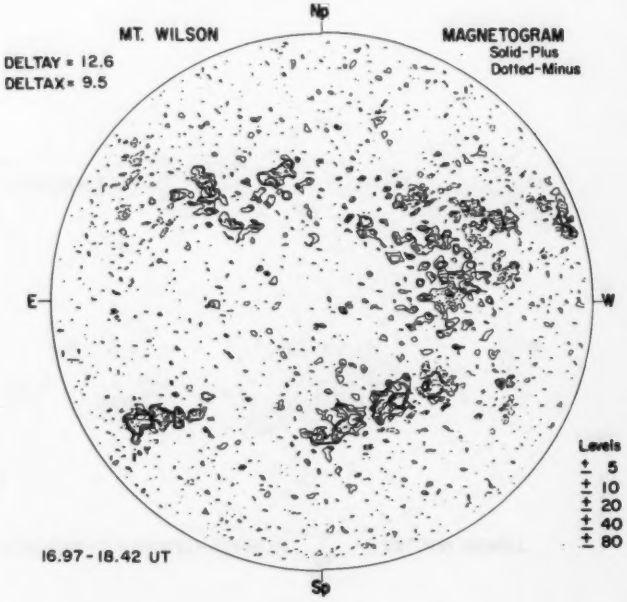
1529 UT

KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



1553 UT

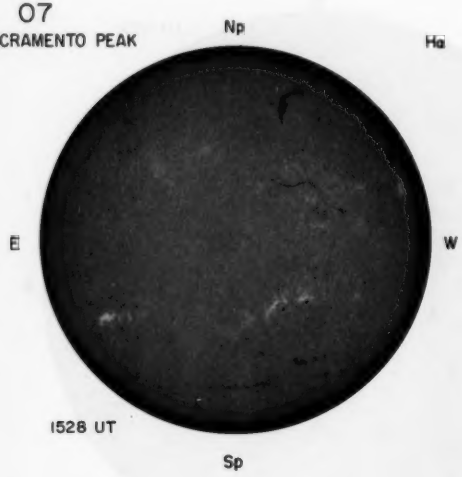
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus
DELTAY = 12.6
DELTAX = 9.5



16.97 - 18.42 UT

07

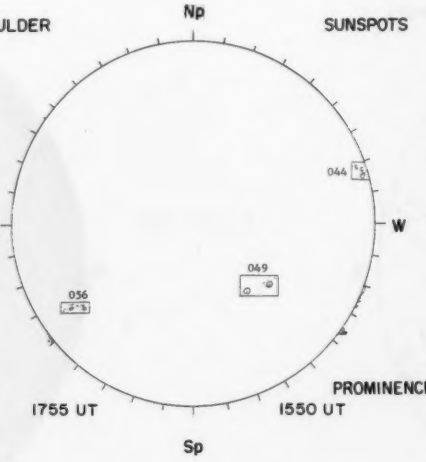
SACRAMENTO PEAK



Ha

1528 UT

BOULDER



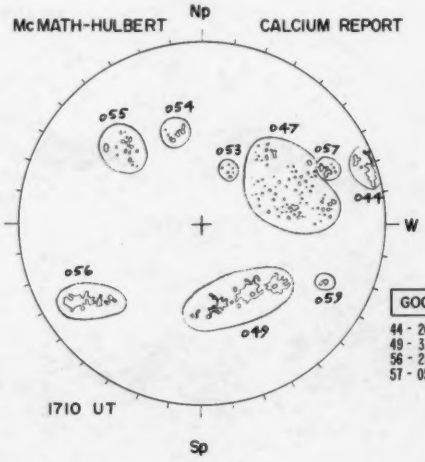
SUNSPOTS

1755 UT

PROMINENCES

1550 UT

McMATH-HULBERT



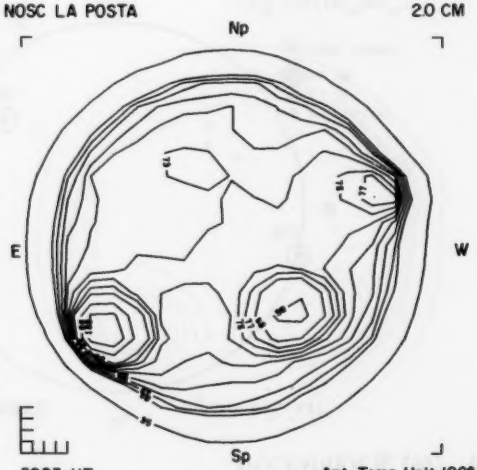
CALCIUM REPORT

1710 UT

GOOD	M
44 - 2600 - 3.5	
49 - 3300 - 3.0	
56 - 2500 - 3.5	
57 - 0500 - 2.5	

NOSC LA POSTA

2.0 CM

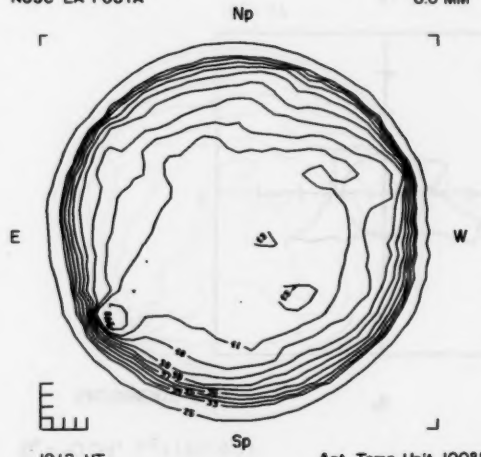


2023 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

8.6 MM

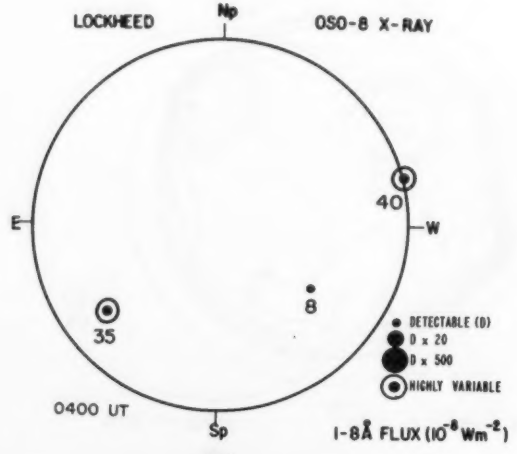


1912 UT

Ant. Temp. Unit 100°K

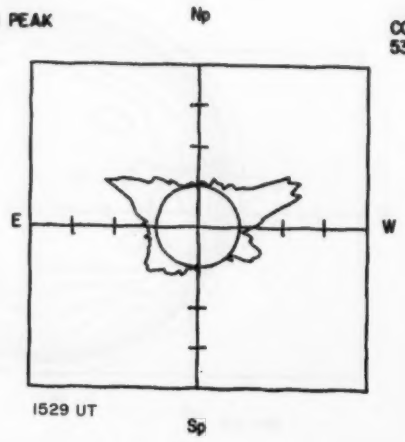
DECEMBER 8, 1977 (P = 13.33, B_o = -0.04, L_o = 176.49)

LOCKHEED OSO-8 X-RAY

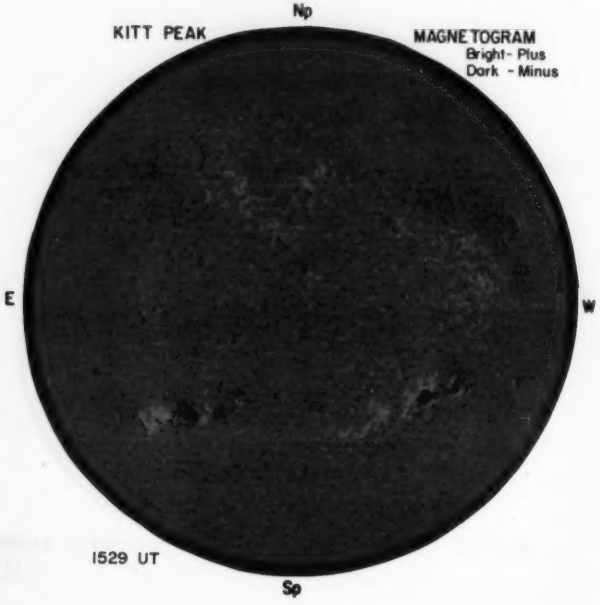


1-8Å FLUX (10^{-8} Wm^{-2})

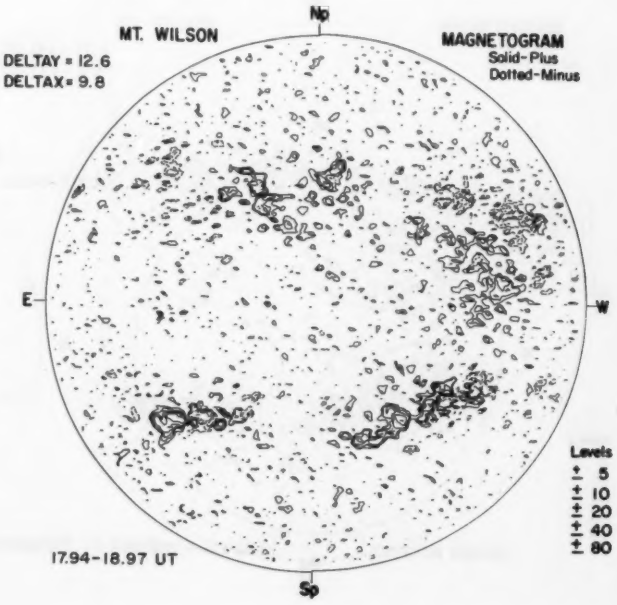
SACRAMENTO PEAK CORONA (1.15 $R_\odot$) 5303 Å



KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus
DELTAY = 12.6
DELTAX = 9.8

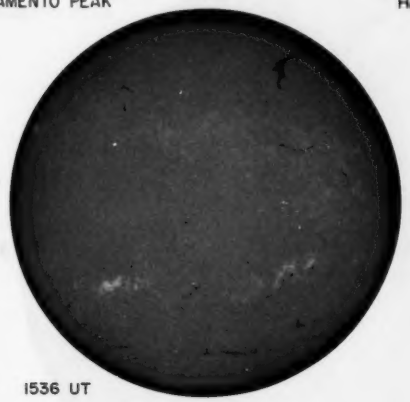


Sp

Sp

08

SACRAMENTO PEAK Np Hα



E W

1536 UT

Sp

BOULDER Np SUNSPOTS

NO DATA

E W

PROMINENCES

Sp

McMATH-HULBERT Np CALCIUM REPORT

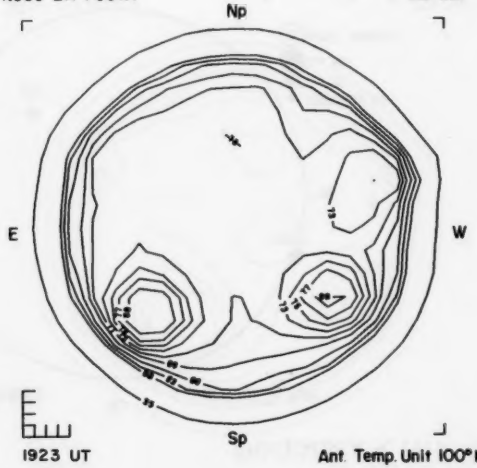
NO DATA

E W

Sp

NOSC LA POSTA 2.0 CM

Np



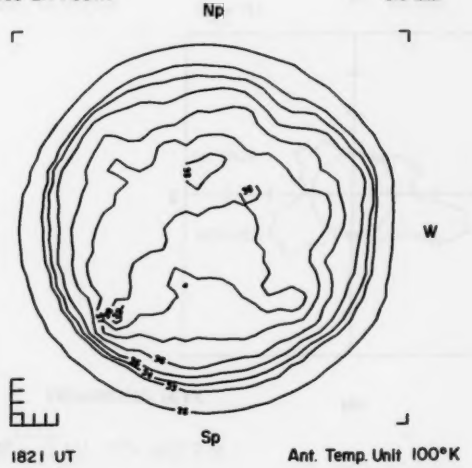
E W

Sp

1923 UT Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

Np



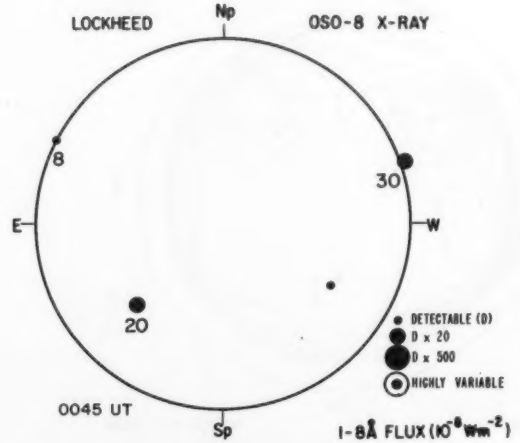
E W

Sp

1821 UT Ant. Temp. Unit 100°K

DECEMBER 9, 1977 (P = 12.90, B_o = -0.17, L_o = 163.31)

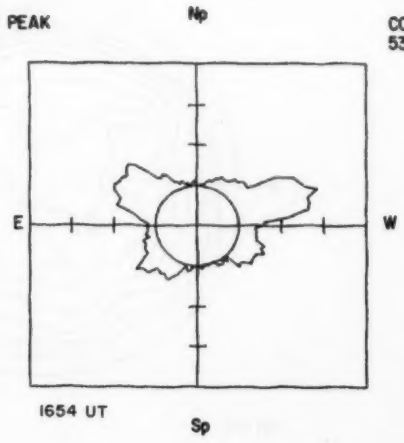
LOCKHEED OSO-8 X-RAY



0045 UT

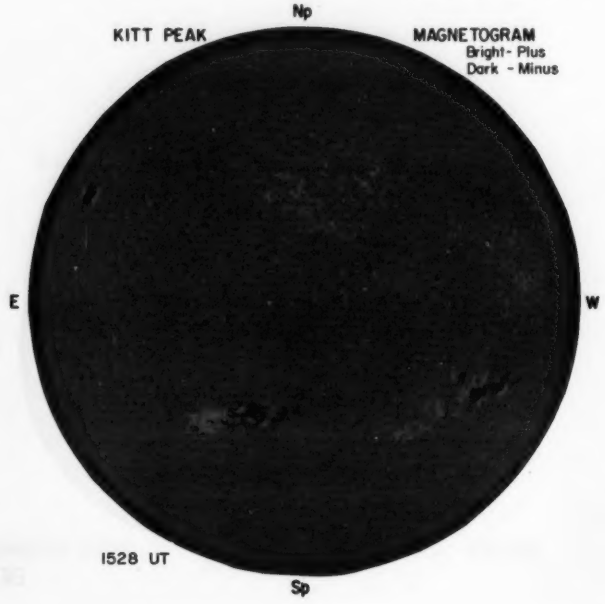
1-8Å FLUX ($KO^{-8}Wm^{-2}$)

SACRAMENTO PEAK CORONA (1.15 $R_\odot$) 5303 Å



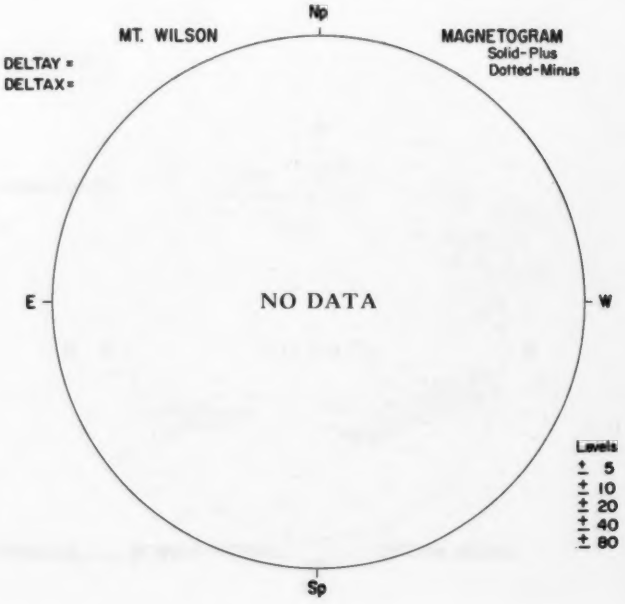
1654 UT

KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



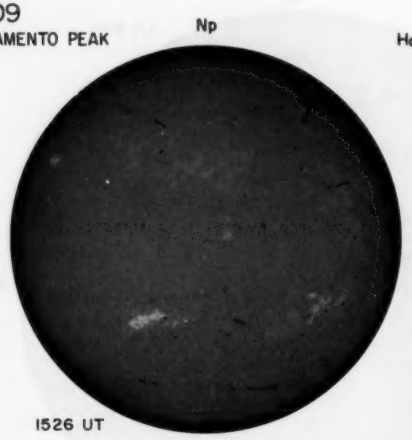
1528 UT

MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus
DELTAY =
DELTAX =



09

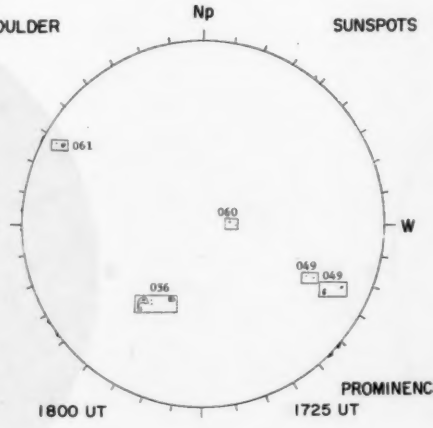
SACRAMENTO PEAK



1526 UT

Hα

BOULDER



1800 UT

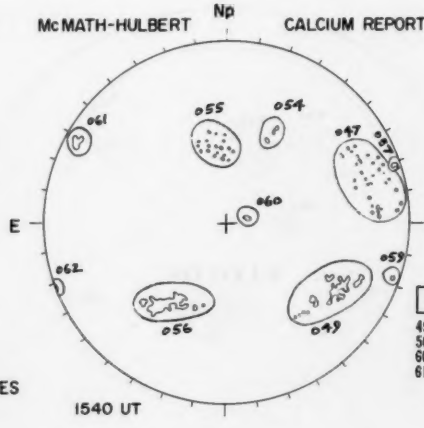
SUNSPOTS

PROMINENCES

1725 UT

McMATH-HULBERT

CALCIUM REPORT

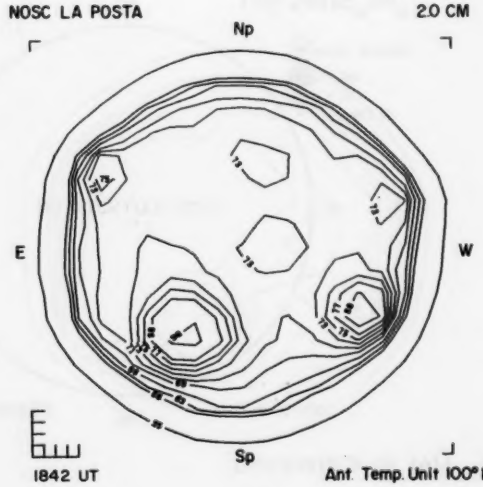


1540 UT

POOR	M
49 - 3000 - 3.0	
56 - 3000 - 3.5	
60 - 0100 - 2.5	
61 - 0900 - 3.5	

NOSC LA POSTA

2.0 CM



1842 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

8.6 MM

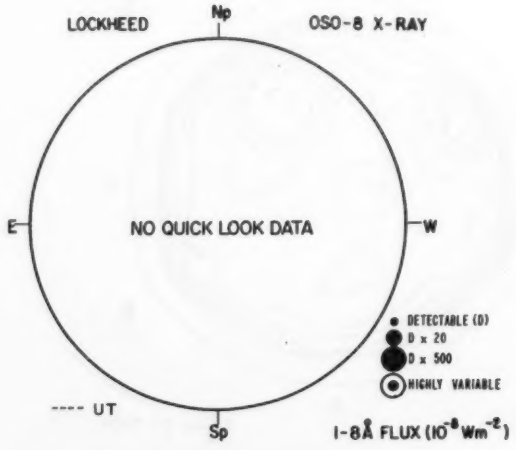
---- UT

Ant. Temp. Unit 100°K

55
Dec 77

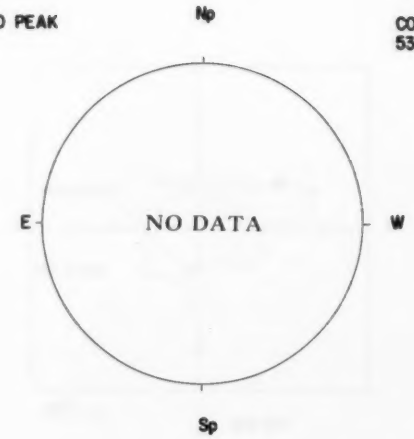
DECEMBER 10, 1977 (P = 12.47, B_o = -0.30, L_o = 150.14)

LOCKHEED OSO-8 X-RAY

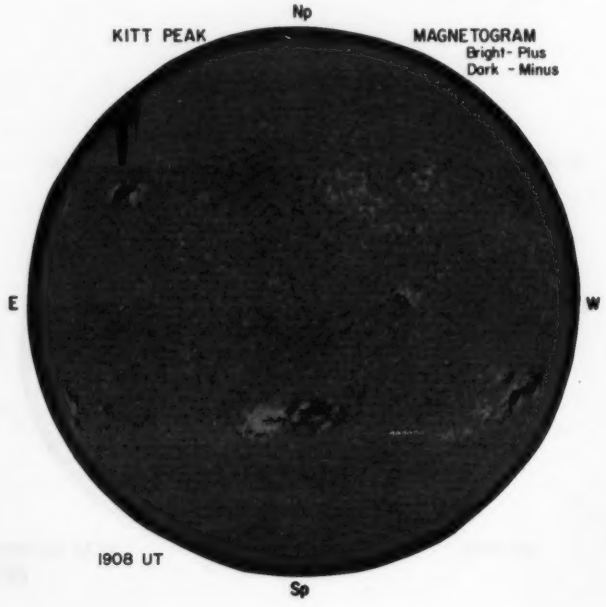


1-8Å FLUX (10^{-8} Wm^{-2})

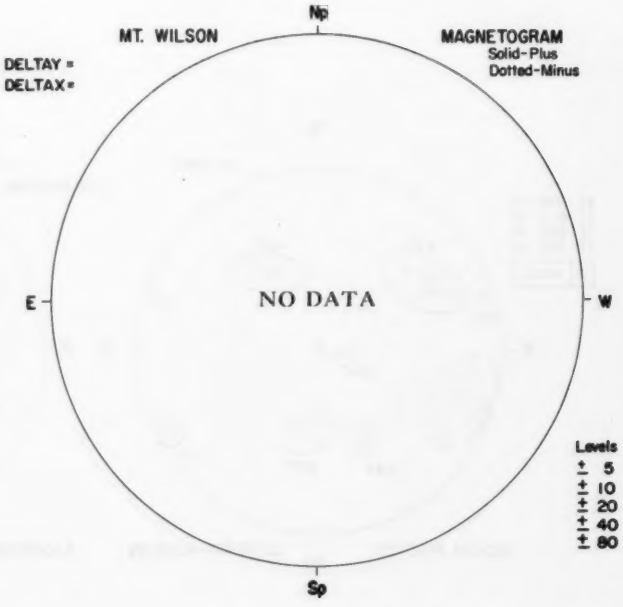
SACRAMENTO PEAK CORONA (1.15 $R_\odot$) 5303 Å



KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus
DELTAY =
DELTAX =

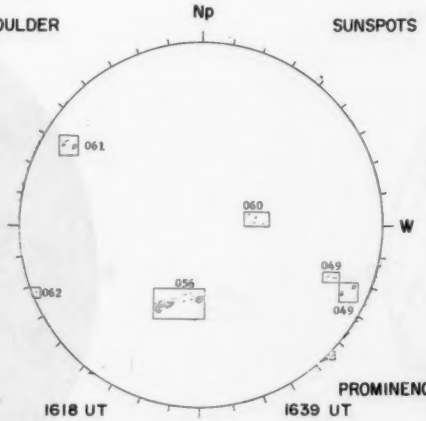


10

SACRAMENTO PEAK Hα

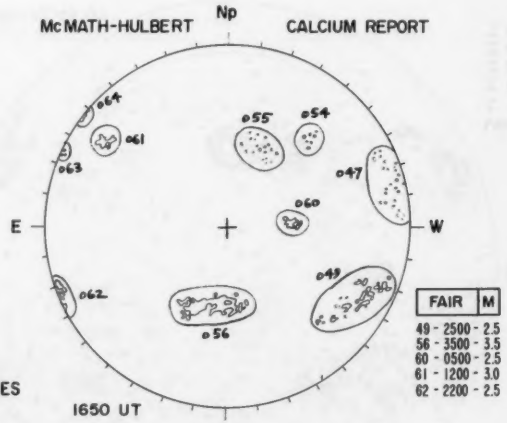
1754 UT

BOULDER SUNSPOTS



1618 UT 1639 UT

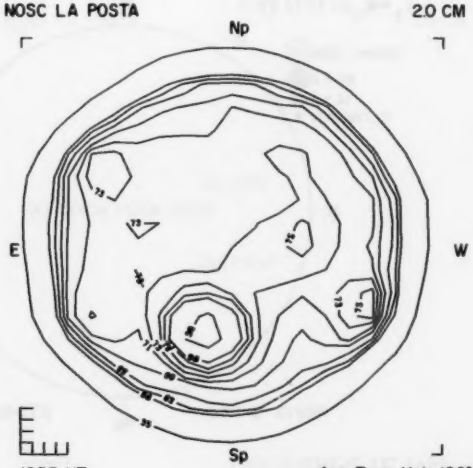
McMATH-HULBERT CALCIUM REPORT



1650 UT

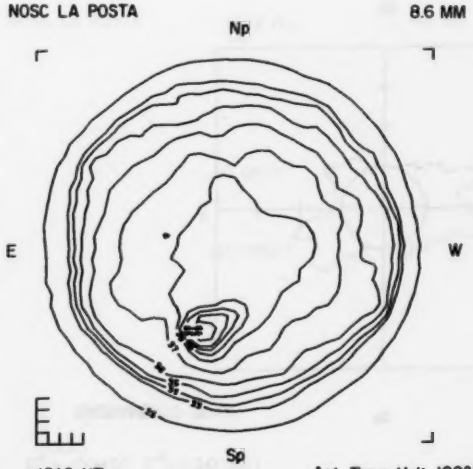
PROMINENCES

NOSC LA POSTA 2.0 CM



1933 UT Ant. Temp. Unit 100°K

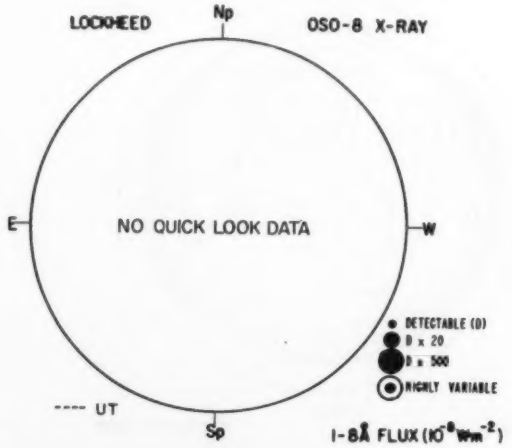
NOSC LA POSTA 8.6 MM



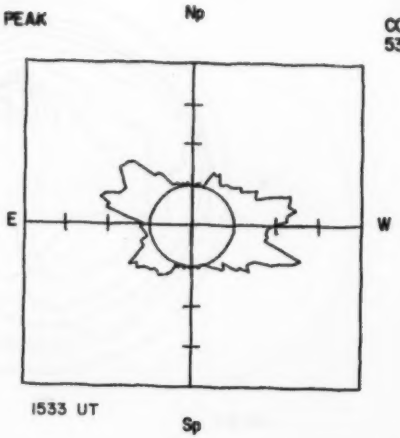
1816 UT Ant. Temp. Unit 100°K

DECEMBER 11, 1977 (P = 12.04, B_o = -0.43, L_o = 136.96)

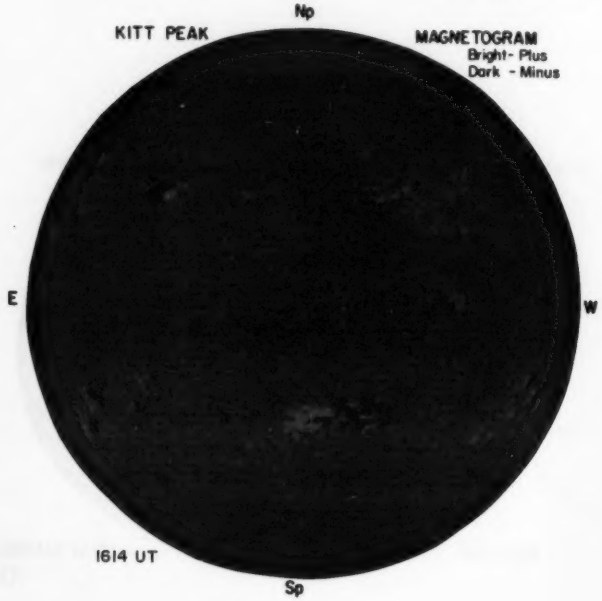
LOCKHEED OSO-8 X-RAY



SACRAMENTO PEAK CORONA (1.15 R_o) 5303 Å

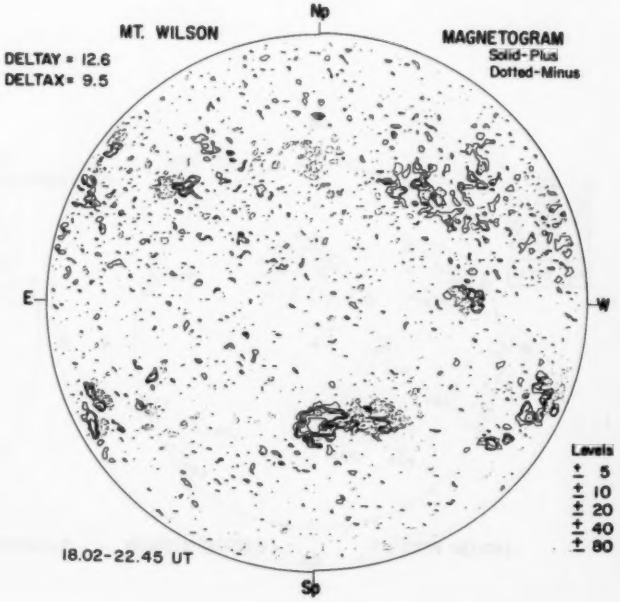


KITT PEAK MAGNETOGRAM Bright - Plus Dark - Minus



MT. WILSON MAGNETOGRAM Solid - Plus Dotted - Minus

DELTAY = 12.6
DELTAX = 9.5



Sp

Sp

SACRAMENTO PEAK

Np

E

W

1559 UT

Sp

Hα BOULDER

Np

E

W

061

062

056

069

049

1645 UT

Sp

SUNSPOTS

1630 UT

PROMINENCES

McMATH-HULBERT

Np

E

W

064

063

067

061

055

054

065

060

066

062

056

048

1600 UT

Sp

CALCIUM REPORT

FAIR	D
49 - 2500 - 2.5	
56 - 3300 - 3.5	
61 - 1000 - 3.0	
62 - 1800 - 2.5	
67 - 0600 - 2.5	

NOSC LA POSTA

2.0 CM

Np

NO DATA

E

EQUIPMENT

W

---- UT

Sp

Ant. Temp. Unit 100°K

NOSC LA POSTA

8.6 MM

Np

NO DATA

E

EQUIPMENT

W

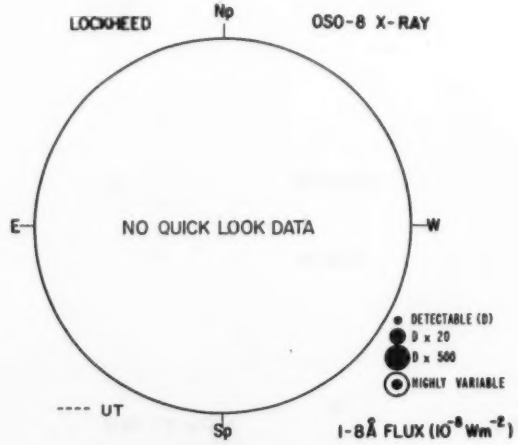
---- UT

Sp

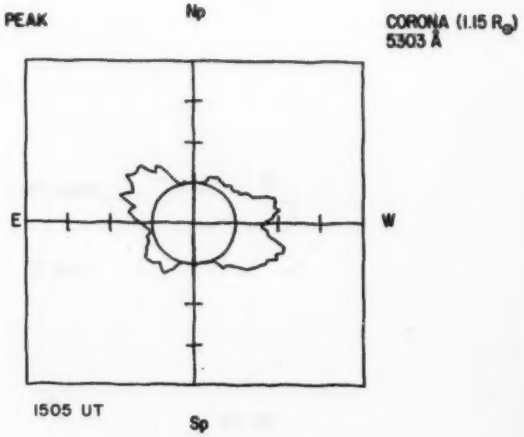
Ant. Temp. Unit 100°K

DECEMBER 12, 1977 (P = 11.60, B_o = -0.55, L_o = 123.78)

LOCKHEED OSO-8 X-RAY



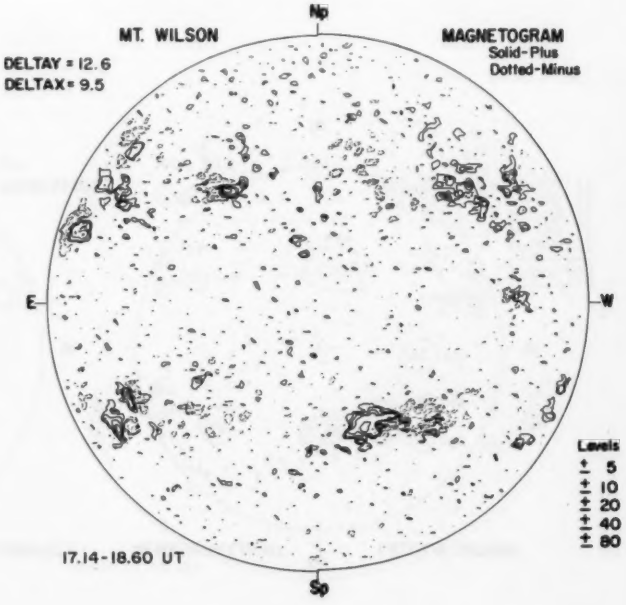
SACRAMENTO PEAK CORONA (1.15 $R_\odot$) 5303 Å



KITT PEAK MAGNETOGRAM Bright - Plus Dark - Minus

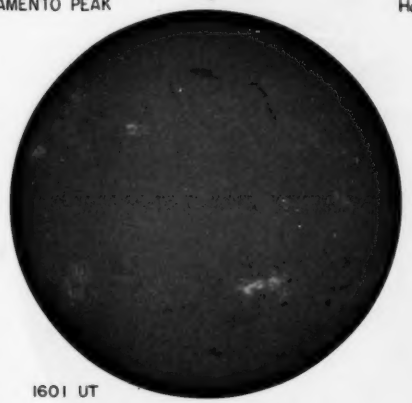
MT. WILSON MAGNETOGRAM Solid - Plus Dotted - Minus

DELTAY = 12.6
DELTAX = 9.5



12

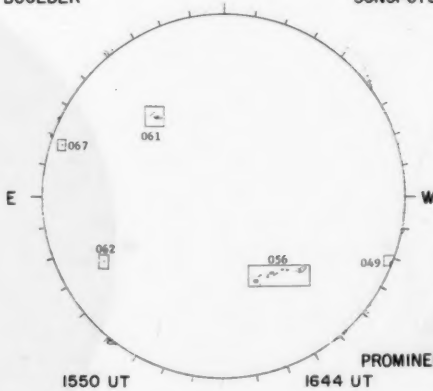
SACRAMENTO PEAK Np Hα



E W

1601 UT Sp

BOULDER Np SUNSPOTS



E W

1550 UT Sp

PROMINENCES

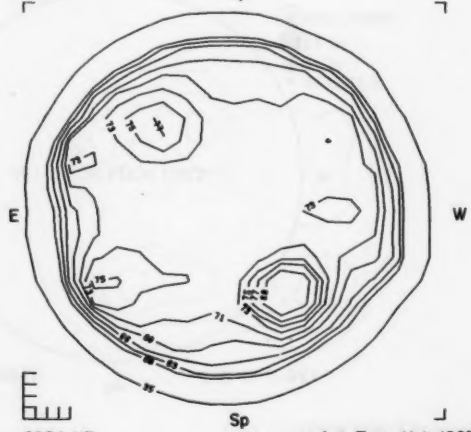
1644 UT

McMATH-HULBERT Np CALCIUM REPORT

E W

Sp

NOSC LA POSTA 2.0 CM Np

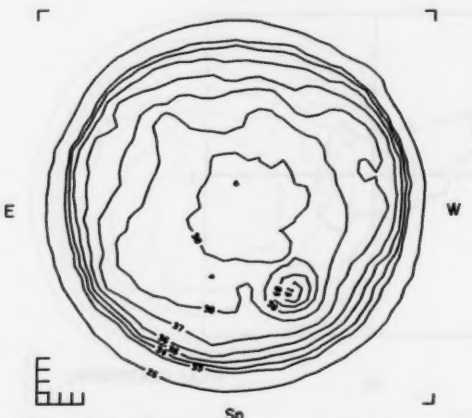


E W

Sp

2054 UT Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM Np

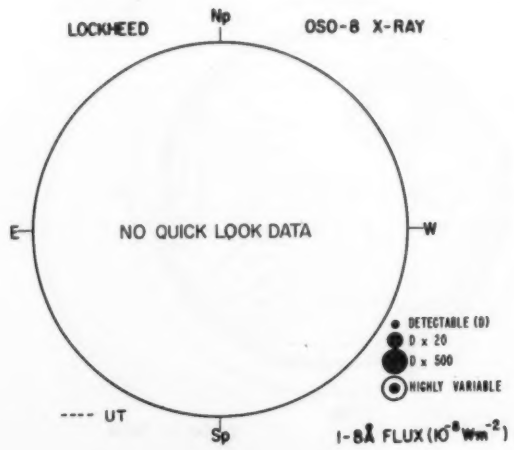


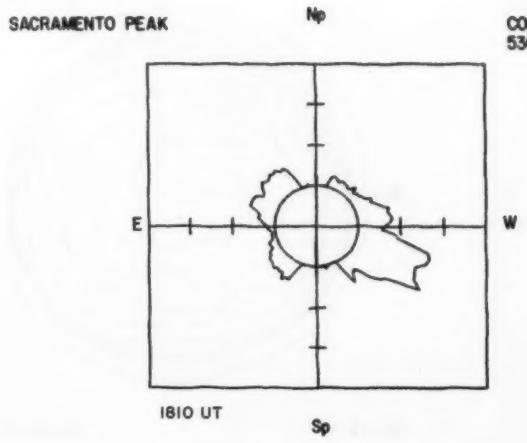
E W

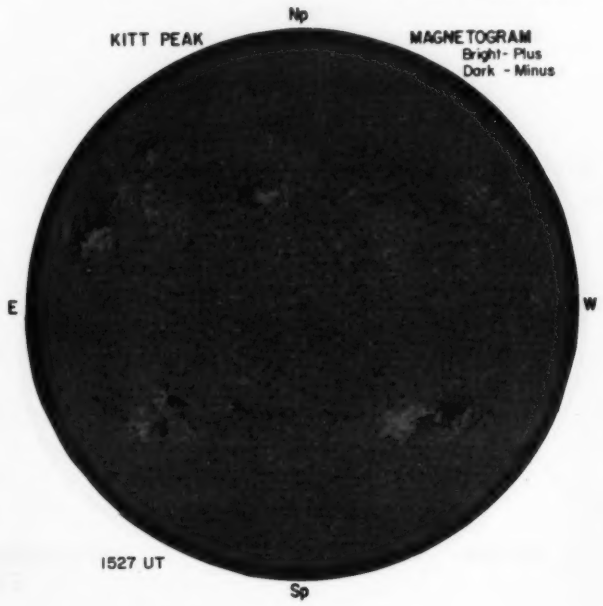
Sp

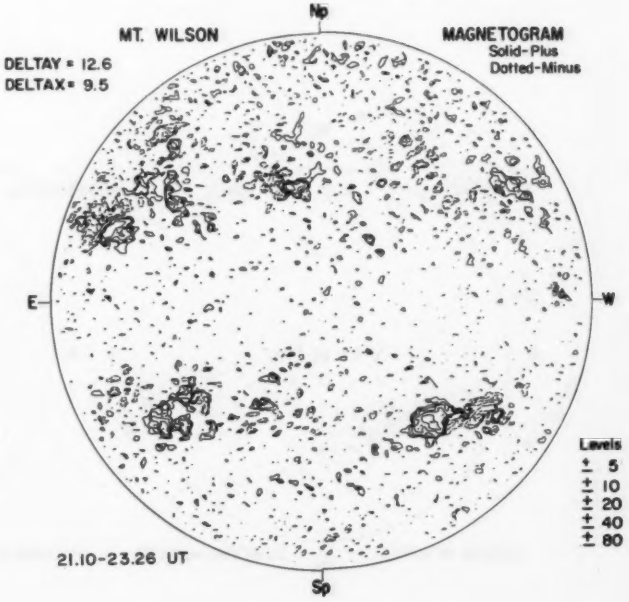
1903 UT Ant. Temp. Unit 100°K

DECEMBER 13, 1977 (P = 11.16, B_o = -0.68, L_o = 110.61)









Sp

Sp

13

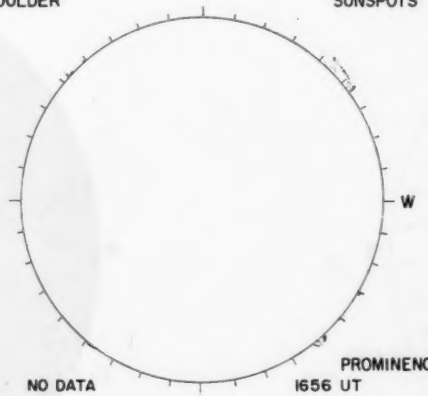
SACRAMENTO PEAK Np Hα

E W

1611 UT

Sp

BOULDER Np SUNSPOTS



E W

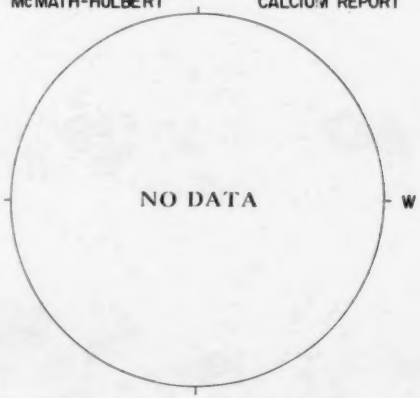
NO DATA

PROMINENCES

1656 UT

Sp

McMATH-HULBERT Np CALCIUM REPORT

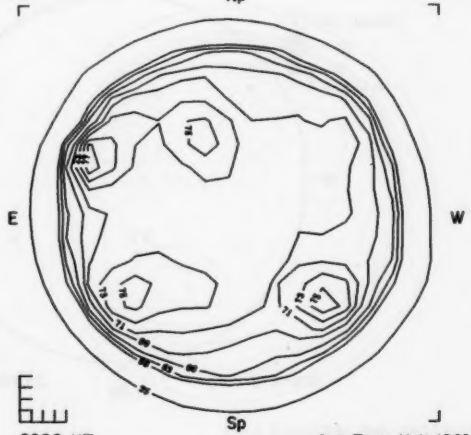


E W

Sp

NOSC LA POSTA 2.0 CM

Np



E W

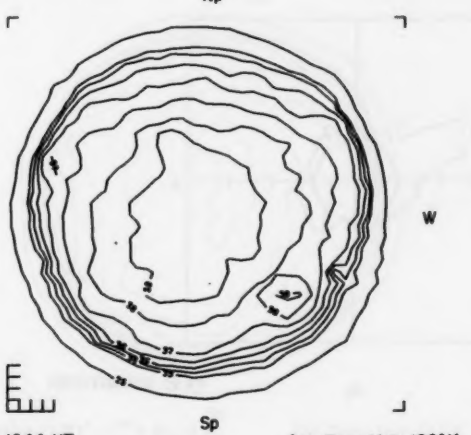
Sp

2022 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

Np



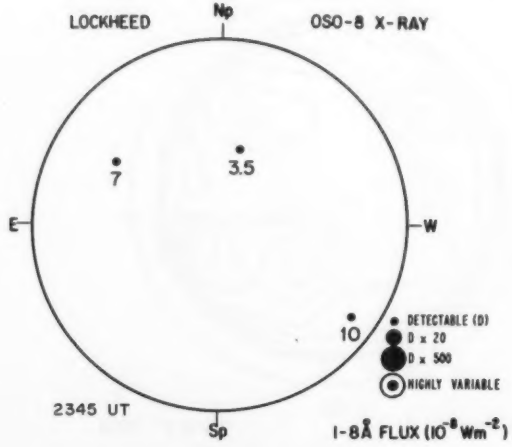
E W

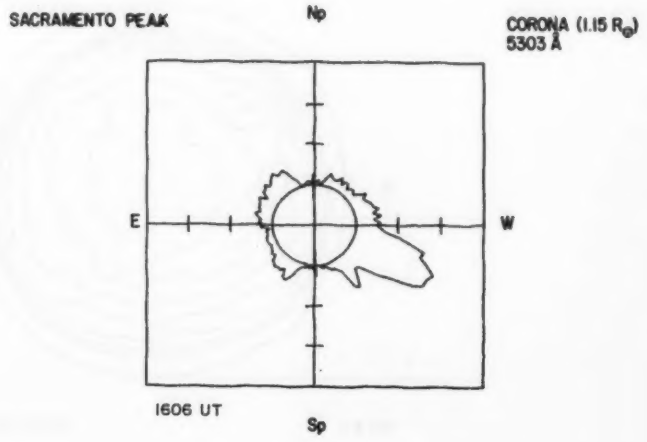
Sp

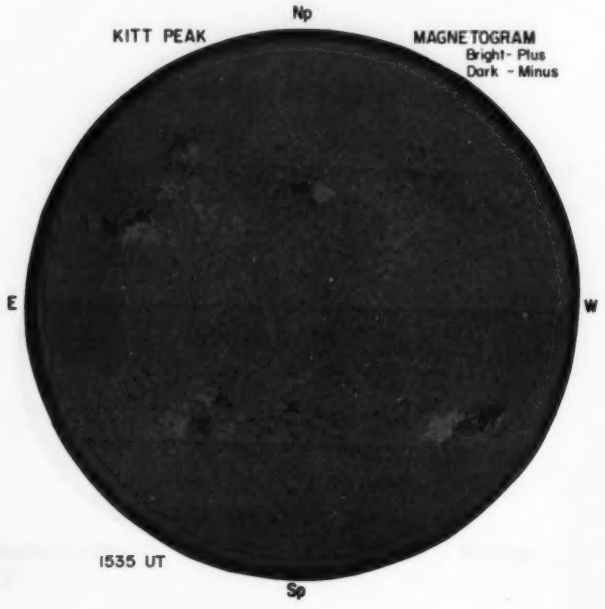
1844 UT

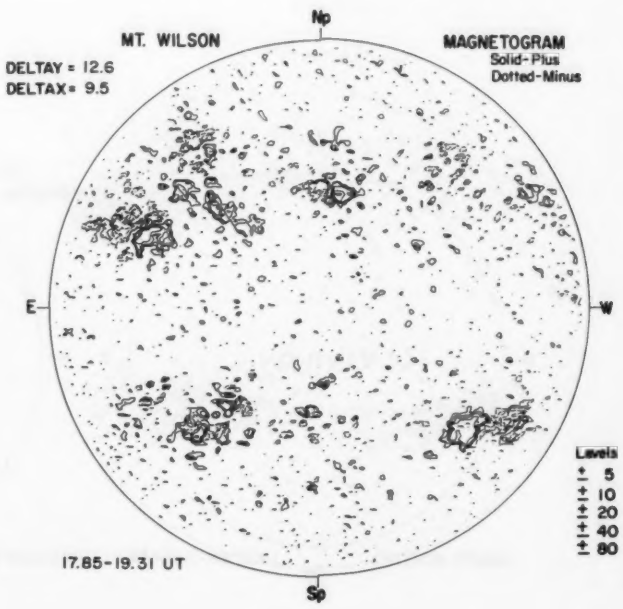
Ant. Temp. Unit 100°K

DECEMBER 14, 1977 (P = 10.71, B_o = -0.81, L_o = 97.43)



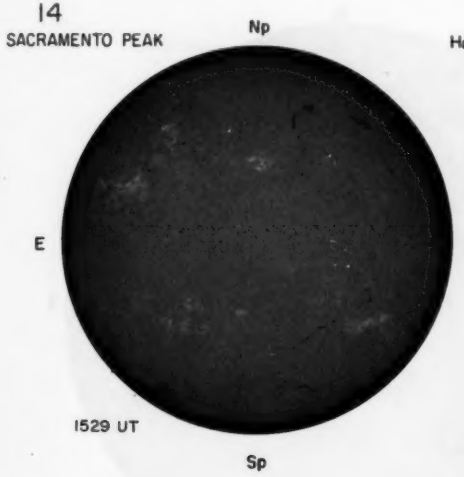






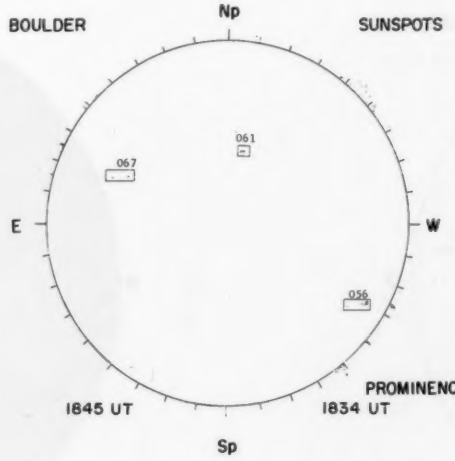
14

SACRAMENTO PEAK



1529 UT

BOULDER

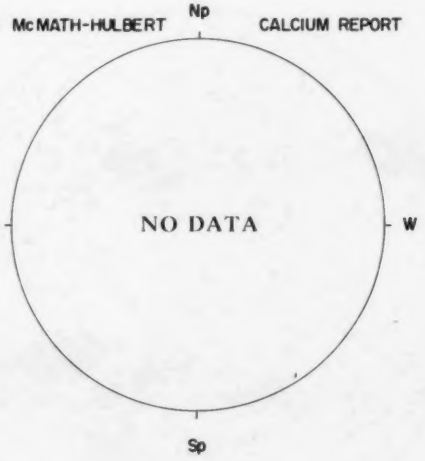


1845 UT

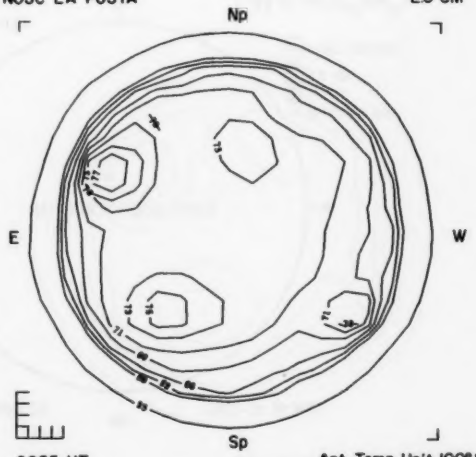
PROMINENCES

1834 UT

McMATH-HULBERT



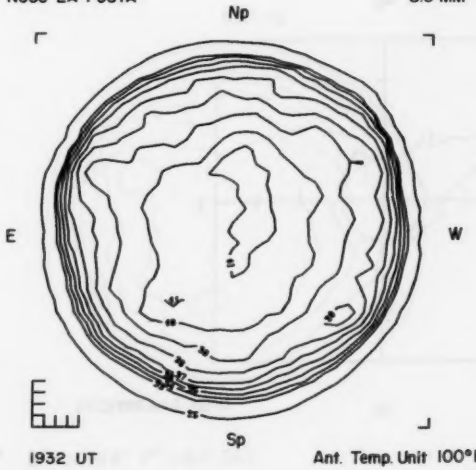
NOSC LA POSTA



2055 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

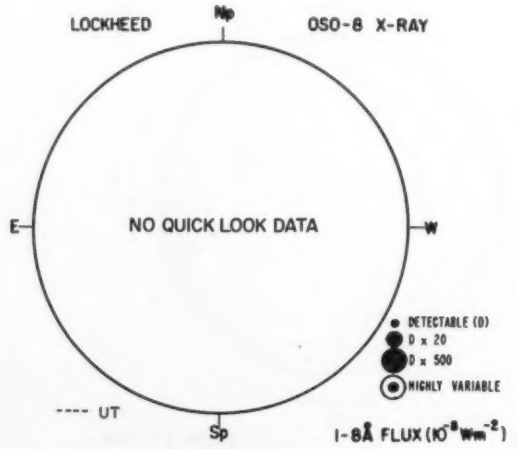


1932 UT

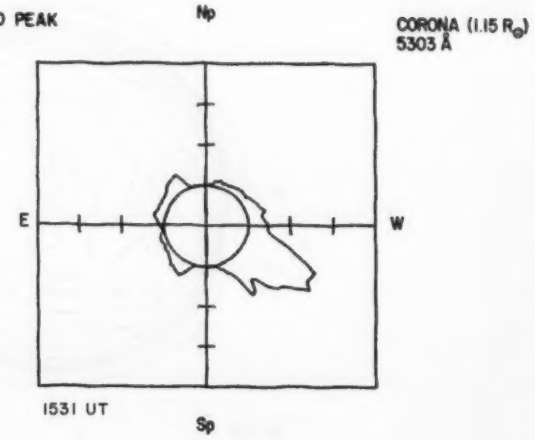
Ant. Temp. Unit 100°K

DECEMBER 15, 1977 (P = 10.26, B_o = -0.94, L_o = 84.26)

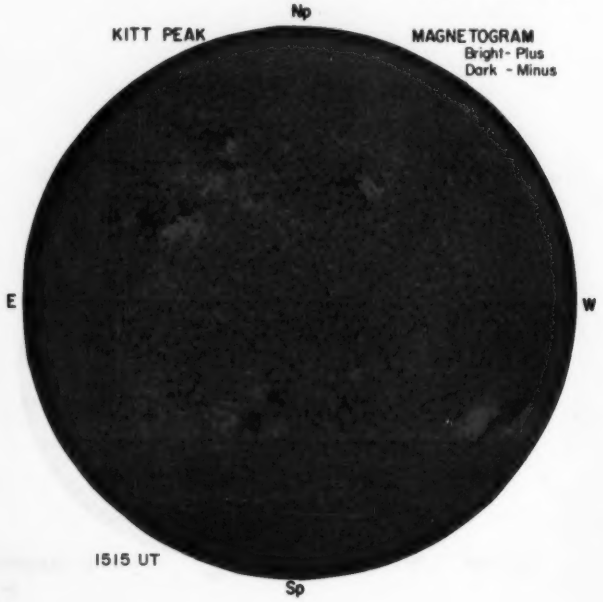
LOCKHEED OSO-8 X-RAY



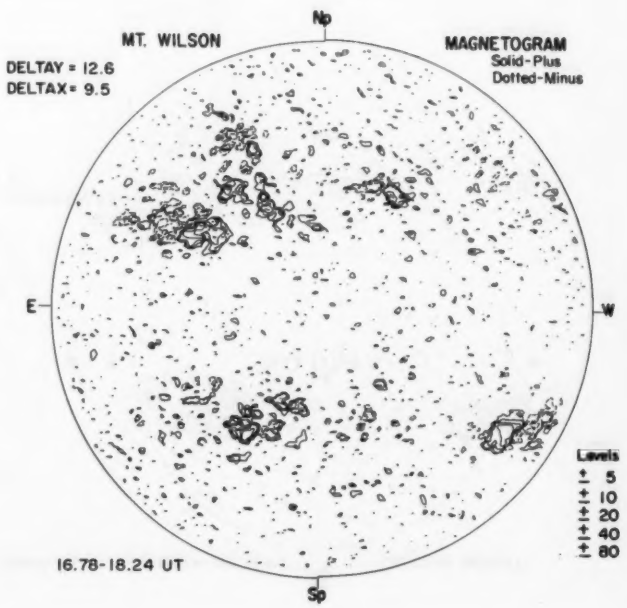
SACRAMENTO PEAK



KITT PEAK

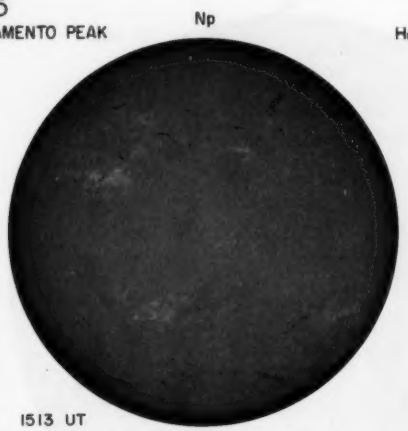


MT. WILSON



15

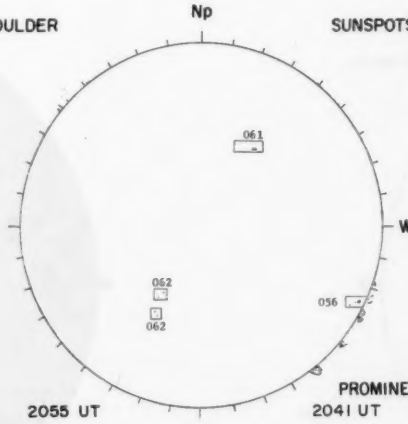
SACRAMENTO PEAK



Hα

1513 UT

BOULDER



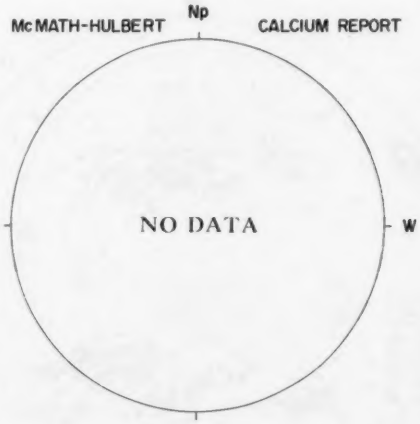
2055 UT

SUNSPOTS

PROMINENCES

2041 UT

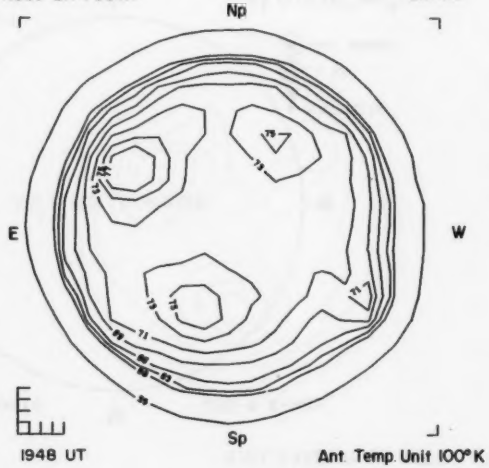
McMATH-HULBERT



CALCIUM REPORT

NOSC LA POSTA

2.0 CM

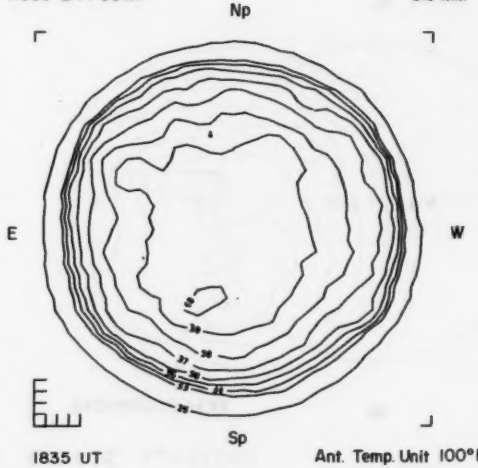


1948 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

8.6 MM

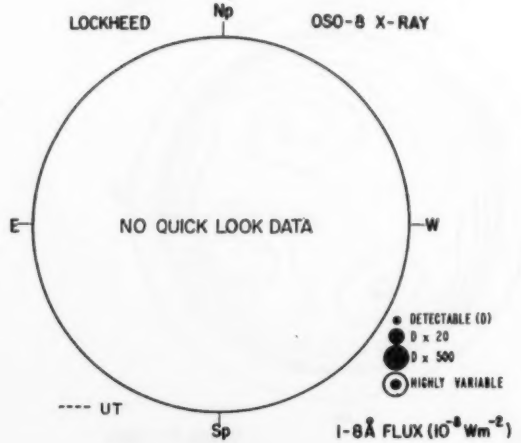


1835 UT

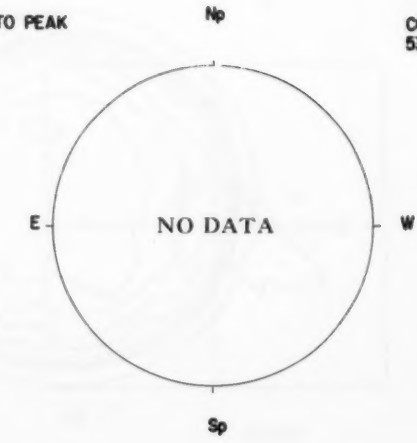
Ant. Temp. Unit 100°K

DECEMBER 16, 1977 (P = 9.80, B_o = -1.06, L_o = 71.09)

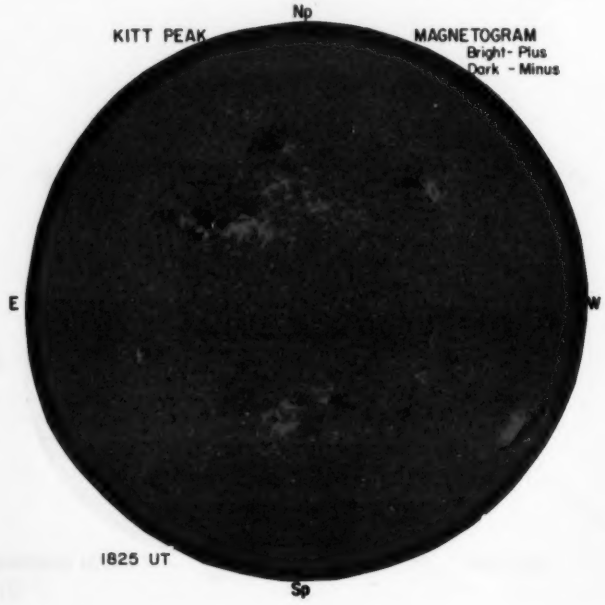
LOCKHEED OSO-8 X-RAY



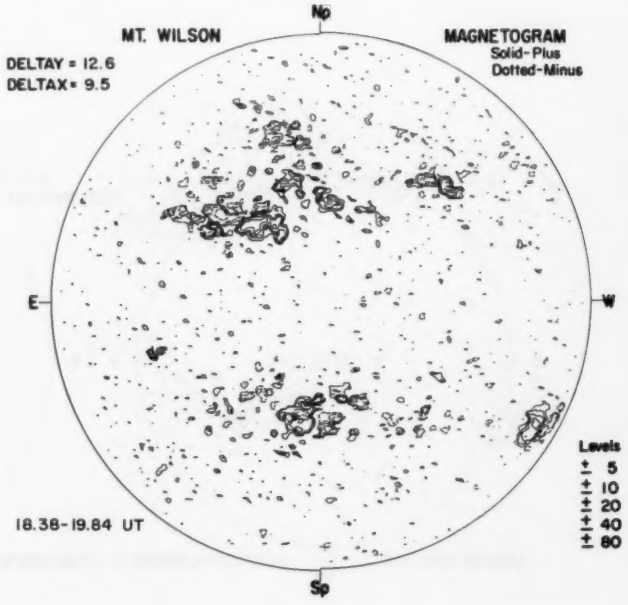
SACRAMENTO PEAK CORONA (1.15 $R_\odot$) 5303 Å



KITT PEAK MAGNETOGRAM Bright - Plus Dark - Minus

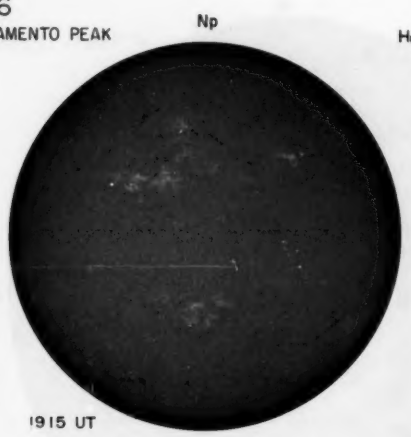


MT. WILSON MAGNETOGRAM Solid - Plus Dotted - Minus



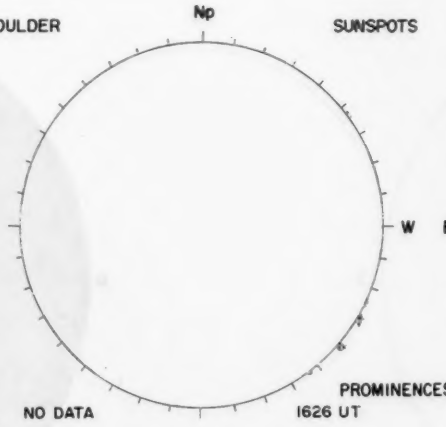
16

SACRAMENTO PEAK



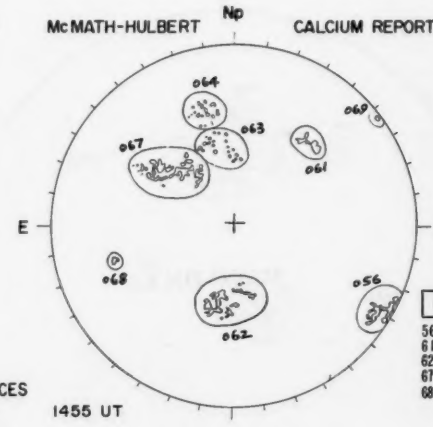
1915 UT

Hα BOULDER



NO DATA

SUNSPOTS



PROMINENCES

1626 UT

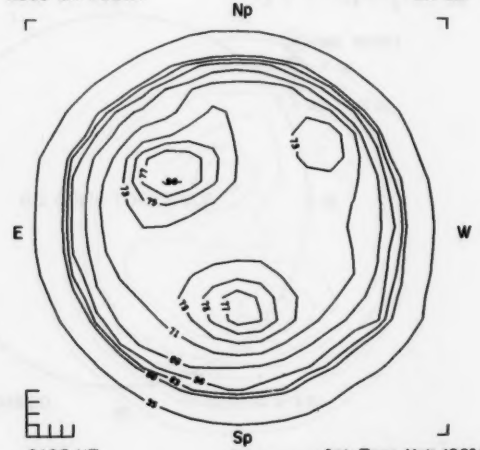
McMATH-HULBERT

CALCIUM REPORT

1455 UT

FAIR	M
56 - 3000 - 2.5	
61 - 0900 - 3.0	
62 - 1800 - 3.0	
67 - 2300 - 3.0	
68 - 0300 - 3.0	

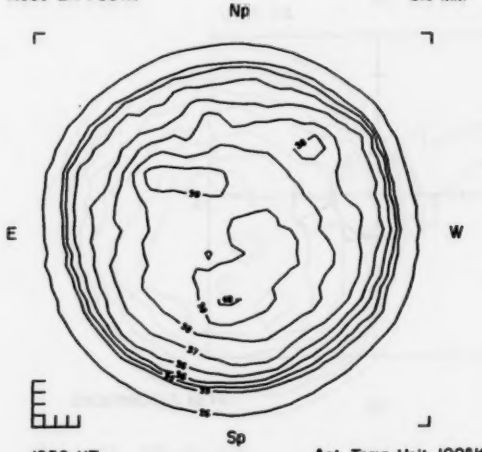
NOSC LA POSTA 2.0 CM



2105 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

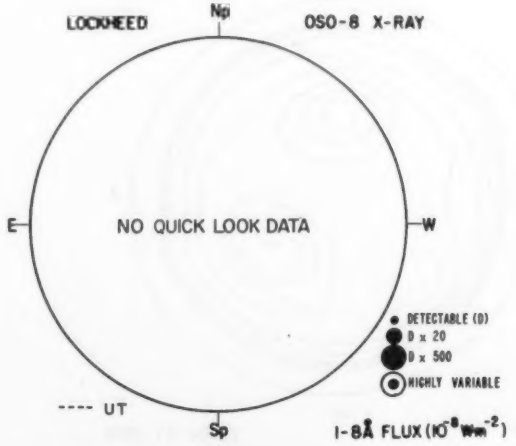


1950 UT

Ant. Temp. Unit 100°K

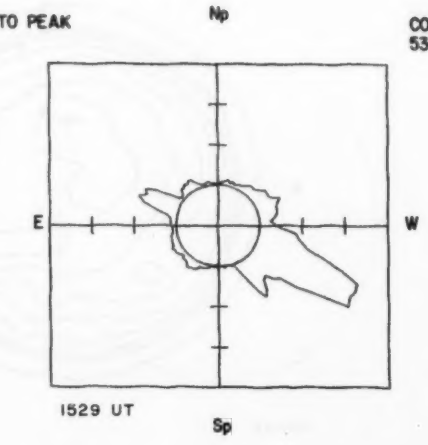
DECEMBER 17, 1977 (P = 9.34, B_o = -1.19, L_o = 57.91)

LOCKHEED OSO-8 X-RAY

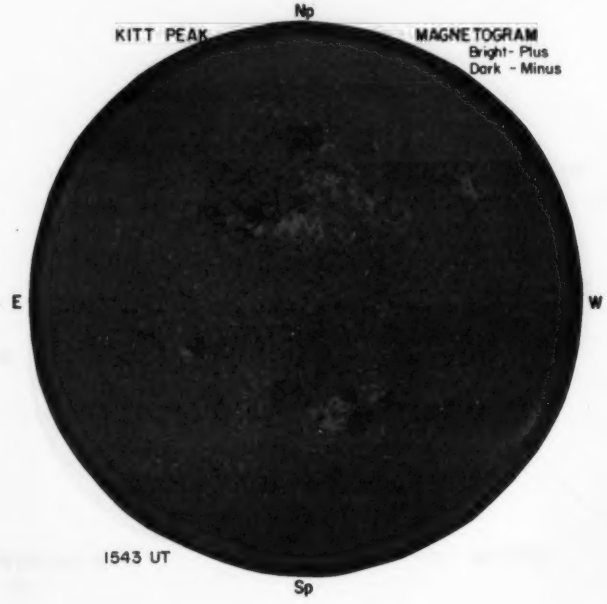


SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å

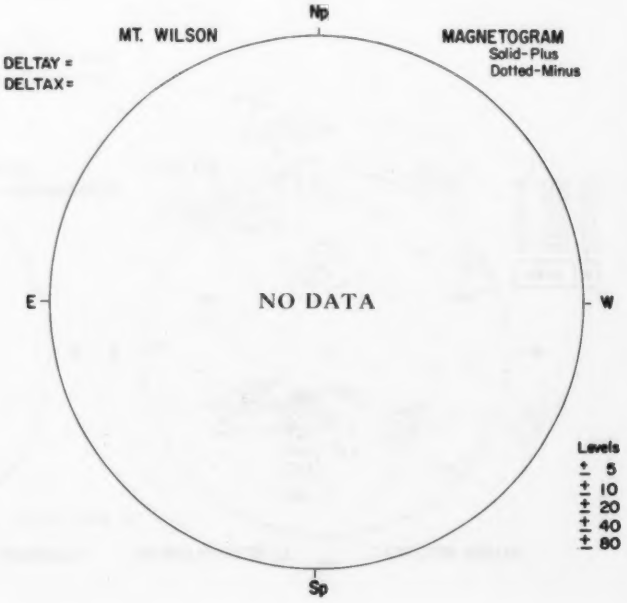


KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



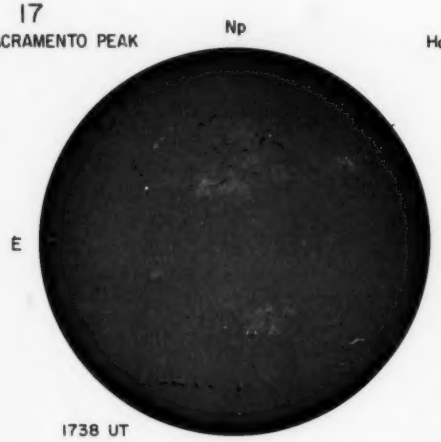
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY =
DELTAX =



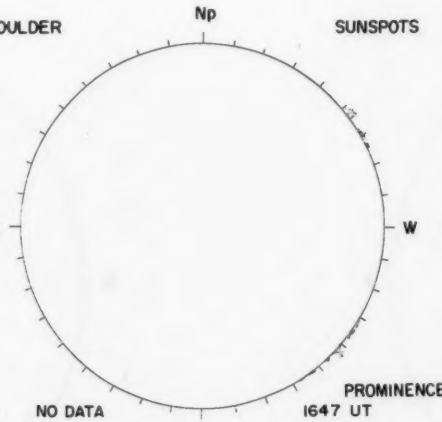
17

SACRAMENTO PEAK Hα



1738 UT

BOULDER SUNSPOTS

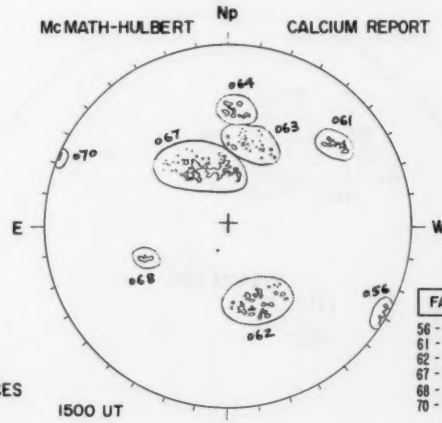


NO DATA

PROMINENCES

1647 UT

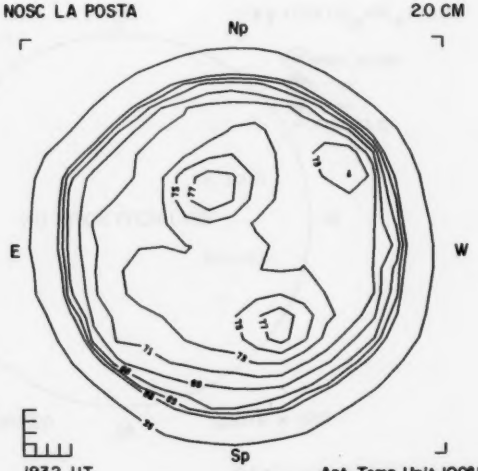
McMATH-HULBERT CALCIUM REPORT



1500 UT

FAIR	M
56 - 2300 - 2.5	
61 - 0900 - 2.5	
62 - 1800 - 2.5	
67 - 2500 - 3.0	
68 - 0400 - 2.5	
70 - 0700 - 2.5	

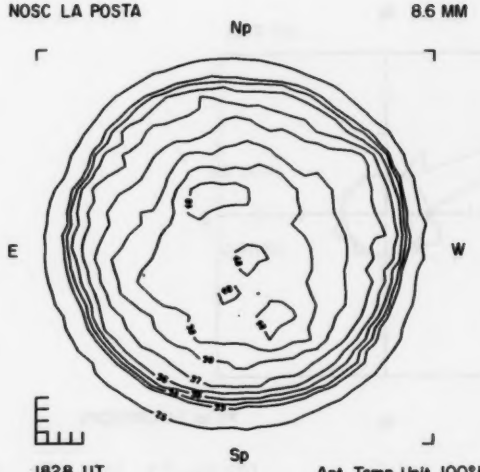
NOSC LA POSTA 2.0 CM



1932 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA 8.6 MM

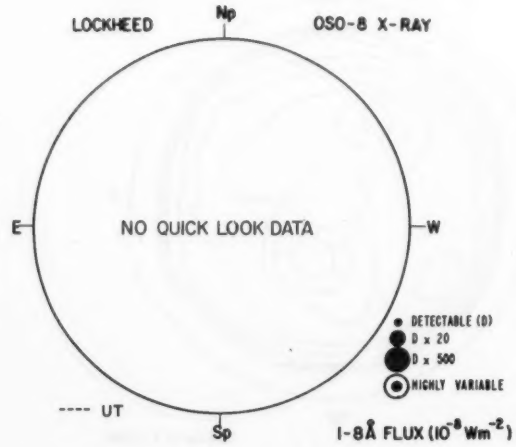


1828 UT

Ant. Temp. Unit 100°K

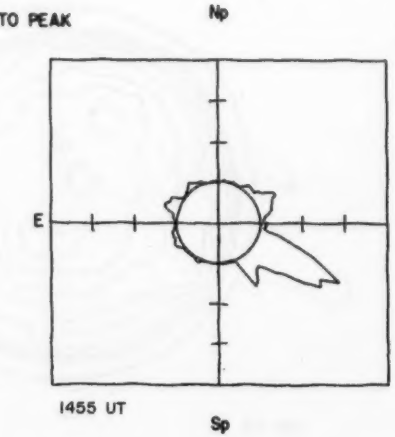
DECEMBER 18, 1977 (P = 8.88, B_o = -1.32, L_o = 44.74)

LOCKHEED OSO-8 X-RAY



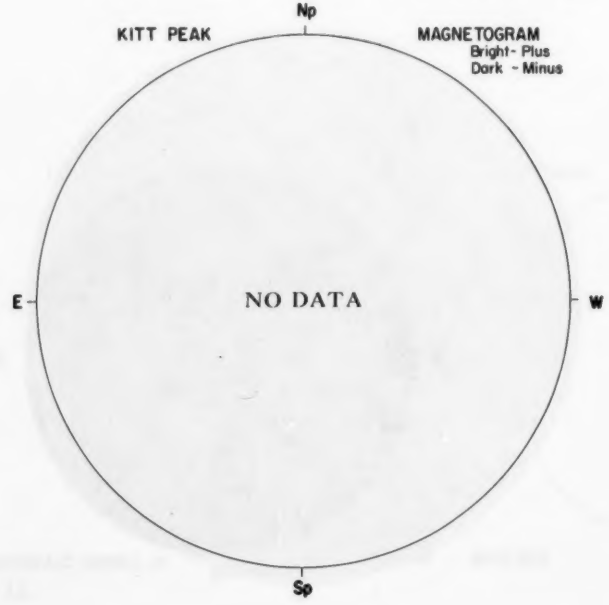
1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK CORONA (1.15 $R_\odot$) 5303 Å

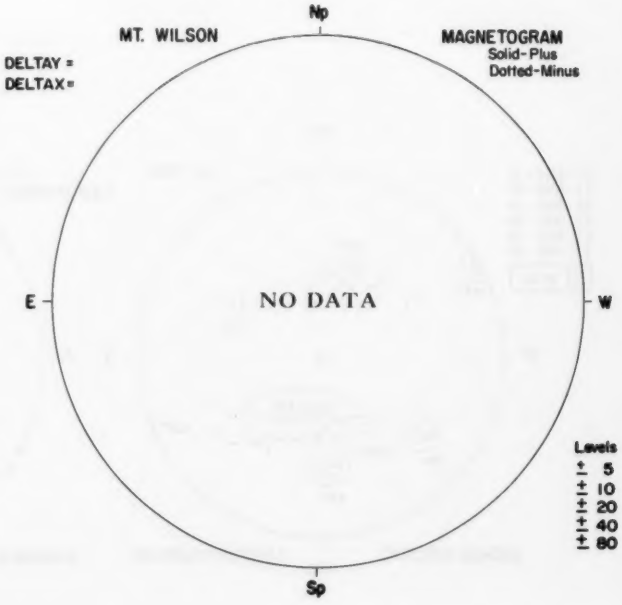


1455 UT

KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus

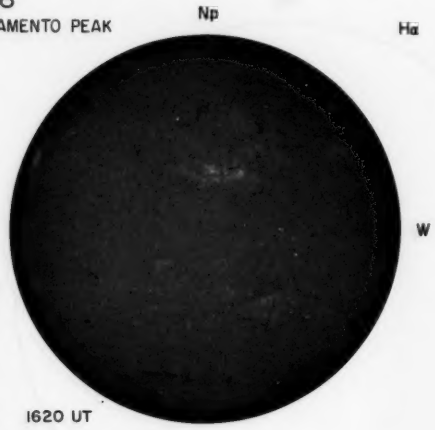


MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus
DELTAY =
DELTAX =

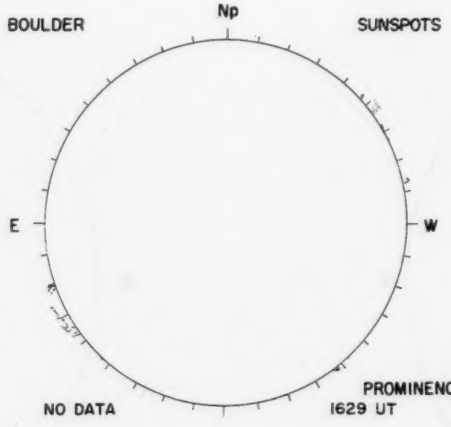


18

SACRAMENTO PEAK



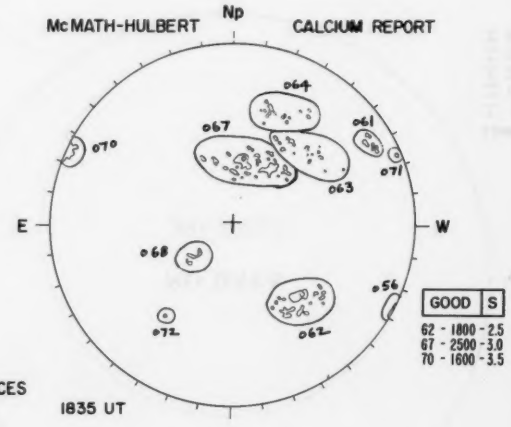
BOULDER



SUNSPOTS

McMATH-HULBERT

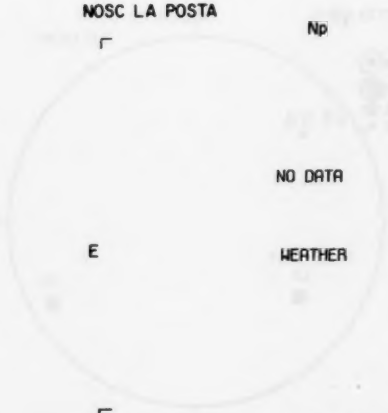
CALCIUM REPORT



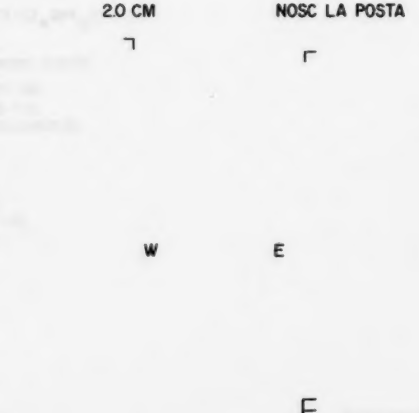
GOOD	S
62 - 1800 - 2.5	
67 - 2500 - 3.0	
70 - 1600 - 3.5	

PROMINENCES

NOSC LA POSTA

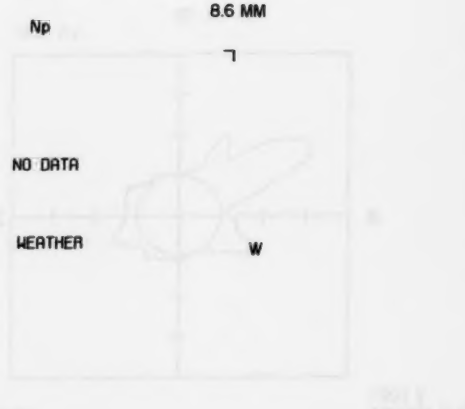


2.0 CM

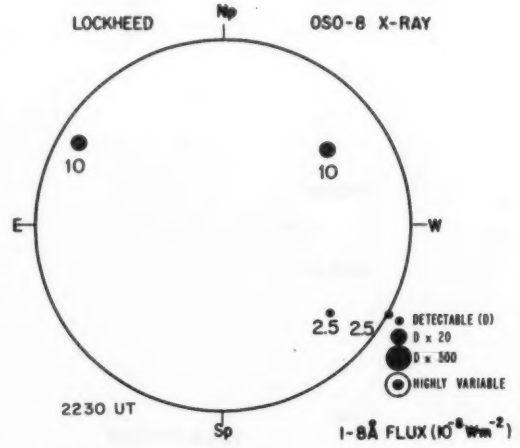


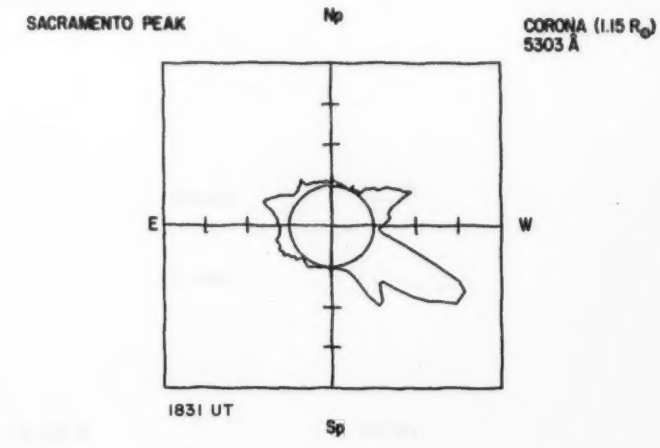
NOSC LA POSTA

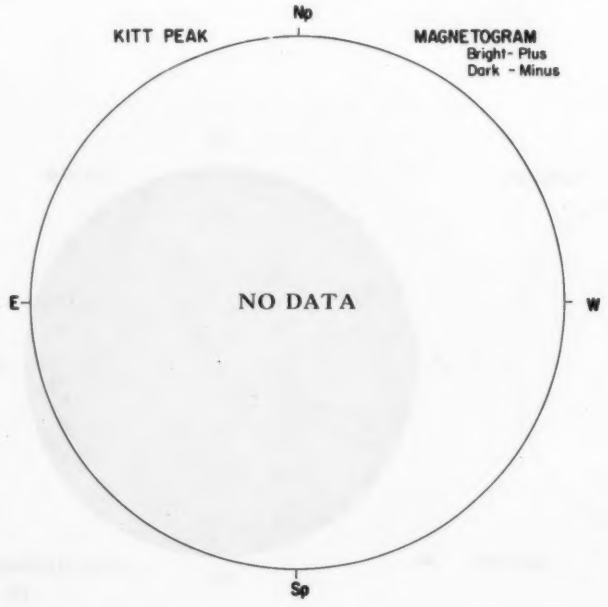
8.6 MM

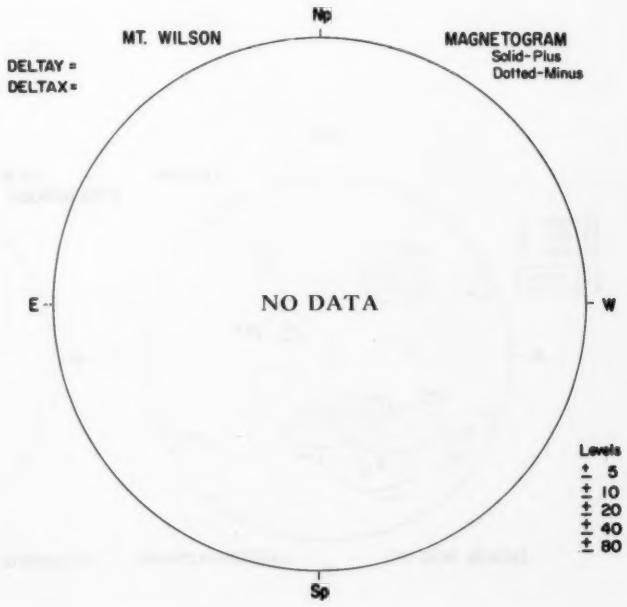


DECEMBER 19, 1977 (P = 8.42, B_o = -1.44, L_o = 31.56)



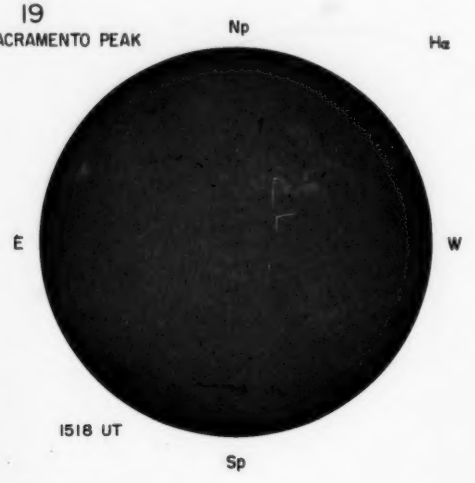




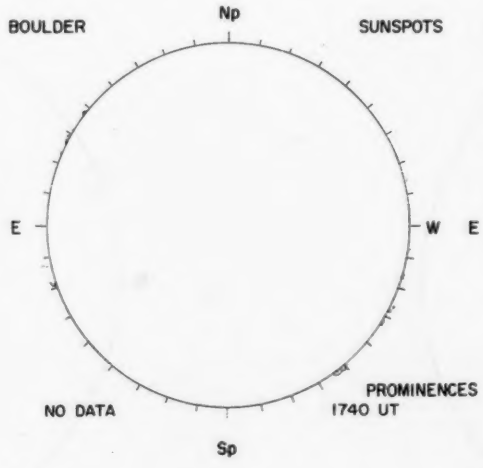


19

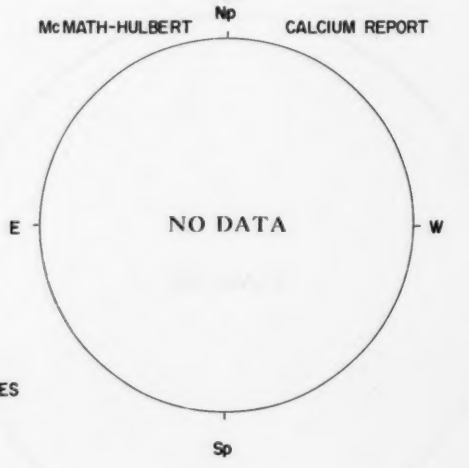
SACRAMENTO PEAK



BOULDER



SUNSPOTS



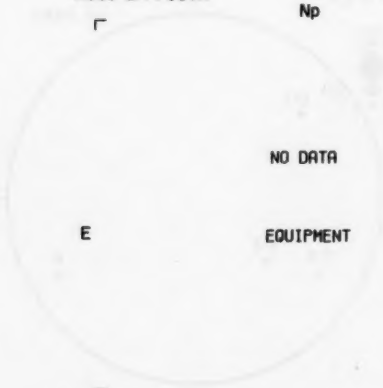
McMATH-HULBERT

CALCIUM REPORT

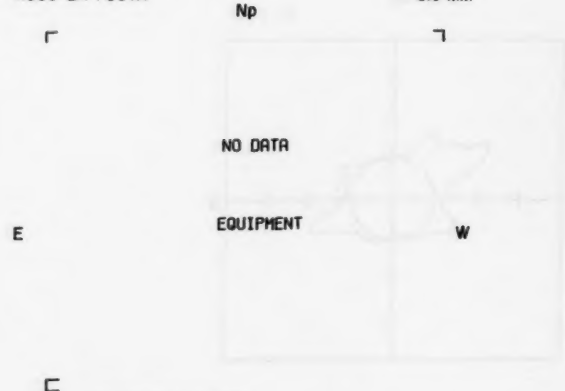
PROMINENCES

1740 UT

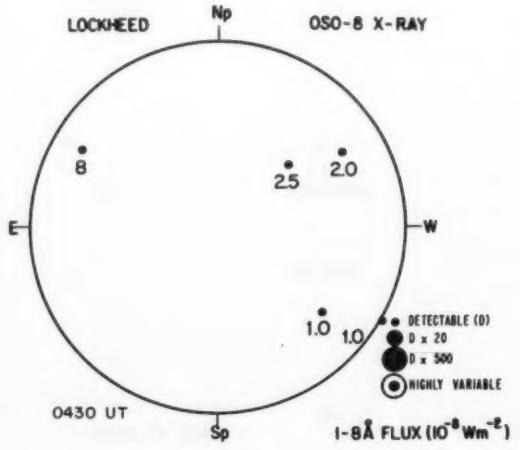
NOSC LA POSTA

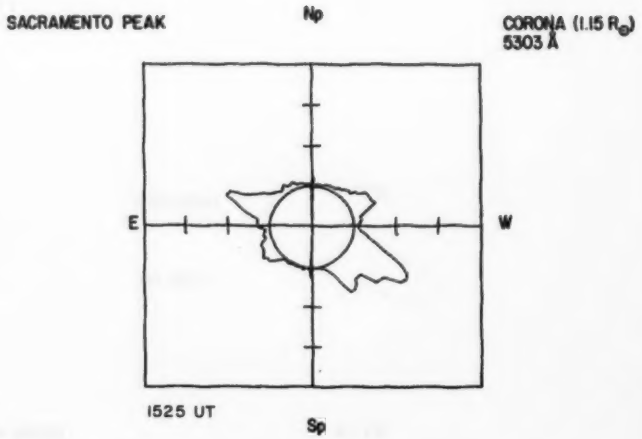


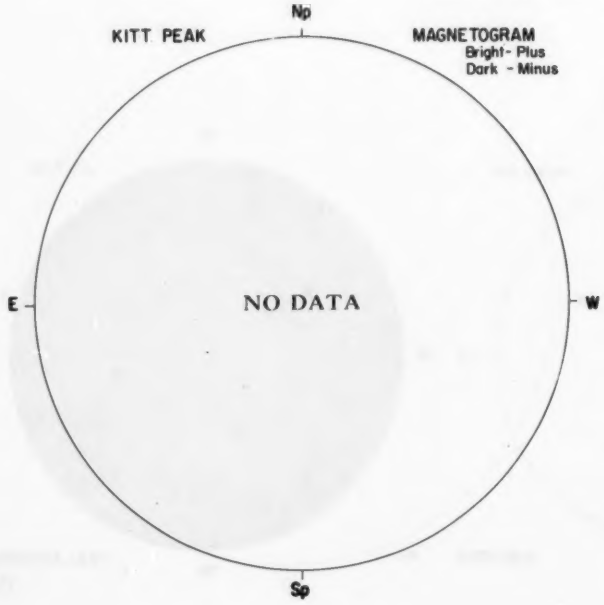
NOSC LA POSTA

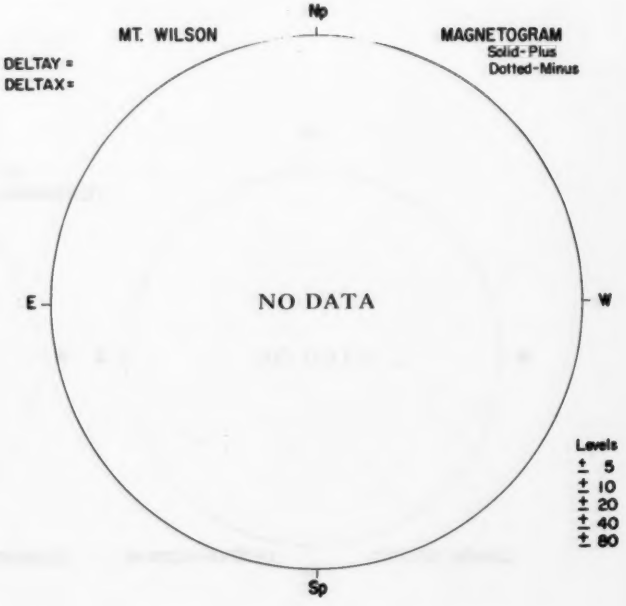


DECEMBER 20, 1977 (P = 7.95, B_o = -1.57, L_o = 18.39)



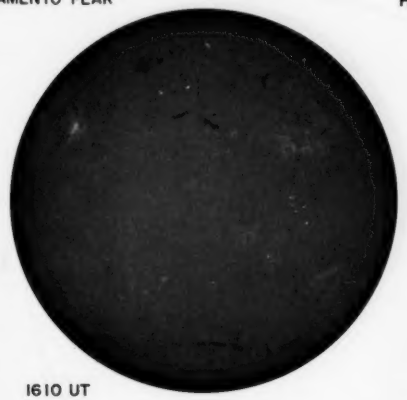






SACRAMENTO PEAK

Np



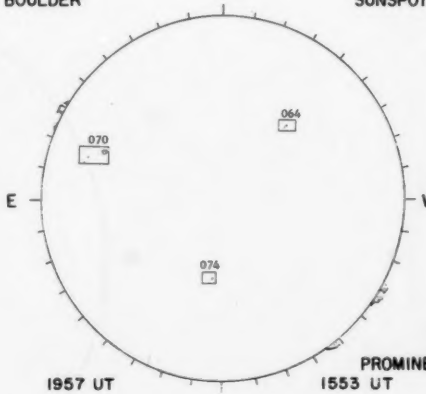
E W

1610 UT

Sp

Hα BOULDER

Np



E W

1957 UT

Sp

SUNSPOTS

PROMINENCES

1553 UT

McMATH-HULBERT

Np

E W

Sp

CALCIUM REPORT

NOSC LA POSTA

Np

2.0 CM

E W

Sp

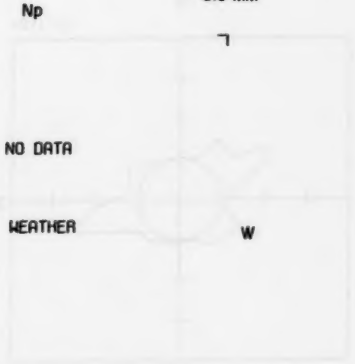
---- UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

Np

8.6 MM



E W

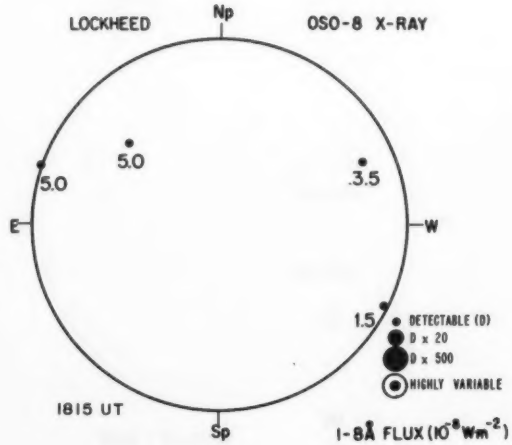
Sp

---- UT

Ant. Temp. Unit 100°K

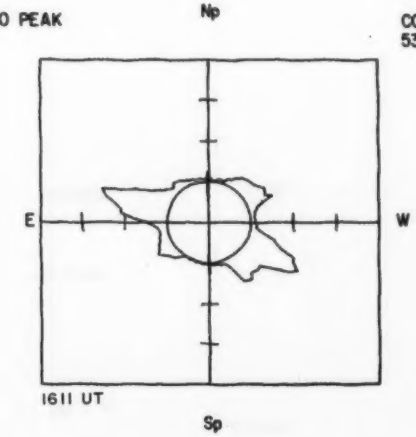
DECEMBER 21, 1977 (P = 7.48, B_o = -1.69, L_o = 5.21)

LOCKHEED OSO-8 X-RAY

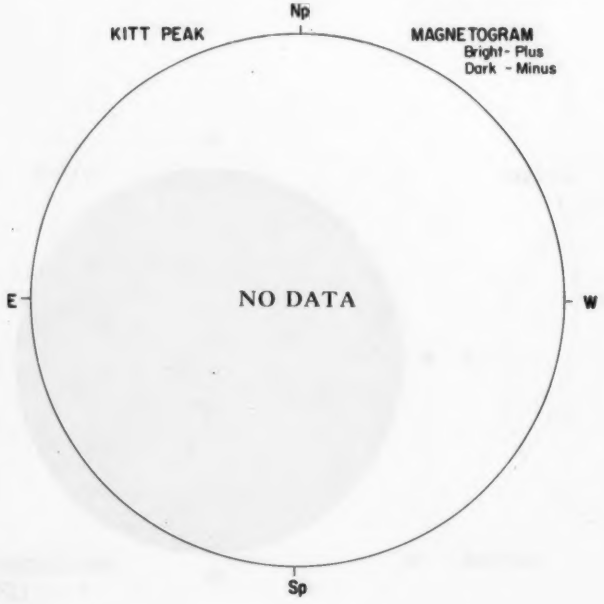


1-8Å FLUX (10^{-8} Wm^{-2})

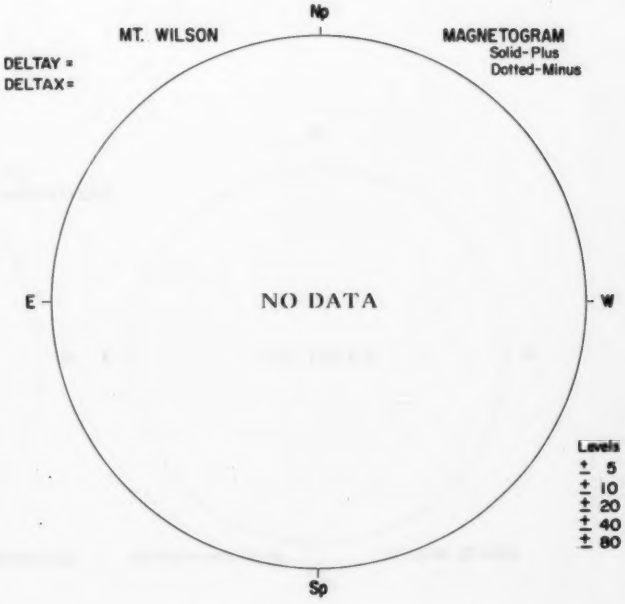
SACRAMENTO PEAK



KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus

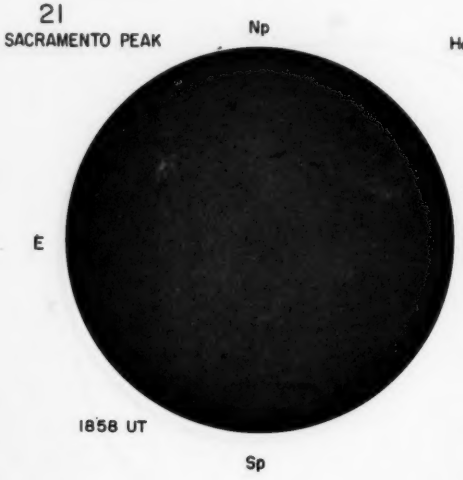


MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus
DELTAY =
DELTAX =

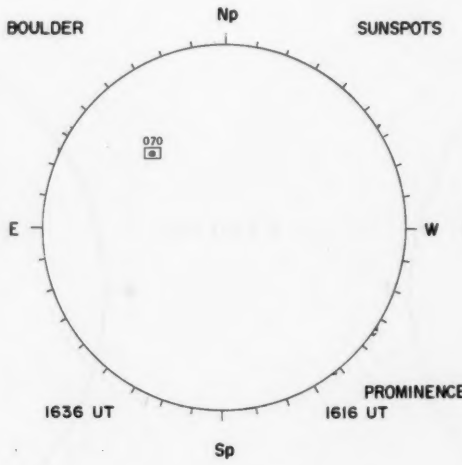


21

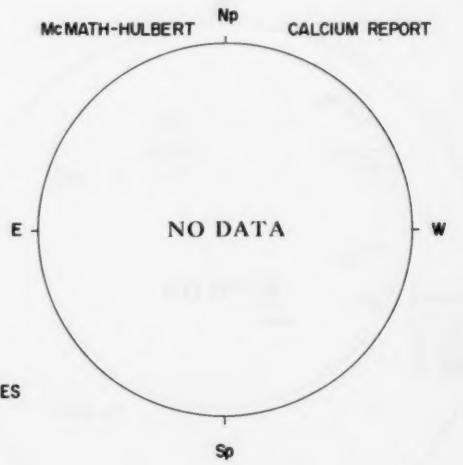
SACRAMENTO PEAK



BOULDER



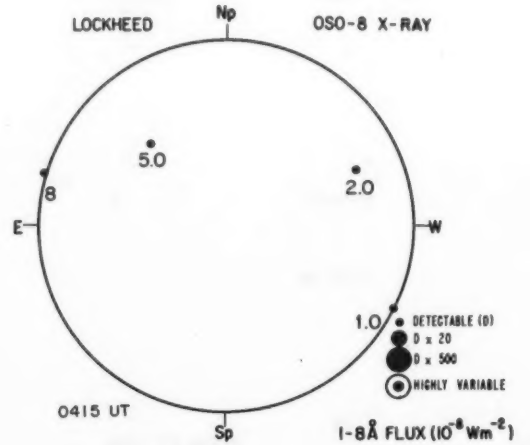
McMATH-HULBERT

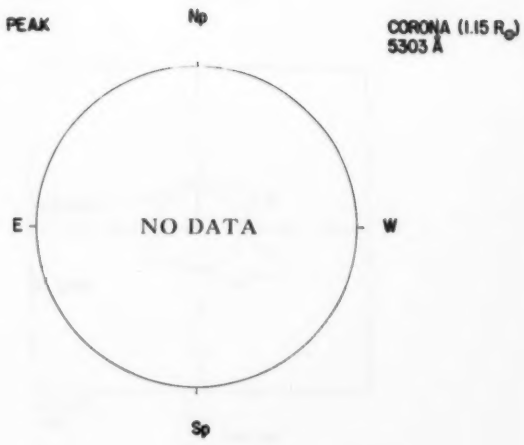


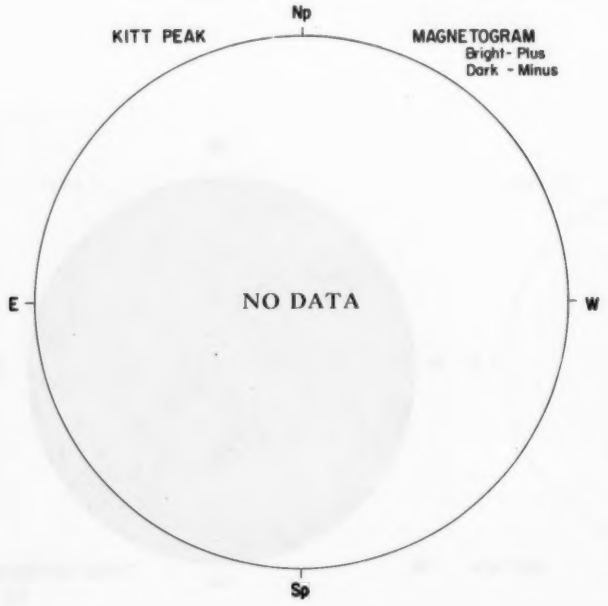
NOSC LA POSTA

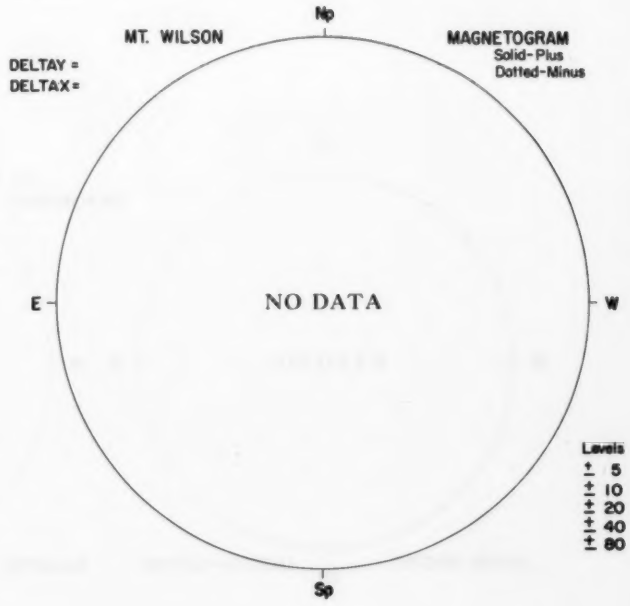
NOSC LA POSTA

DECEMBER 22, 1977 (P = 7.01, B_o = -1.82, L_o = 352.04)



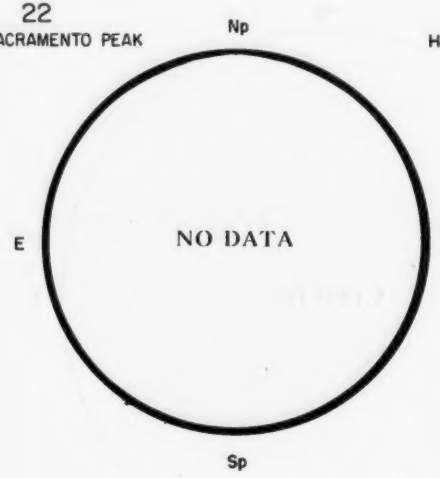




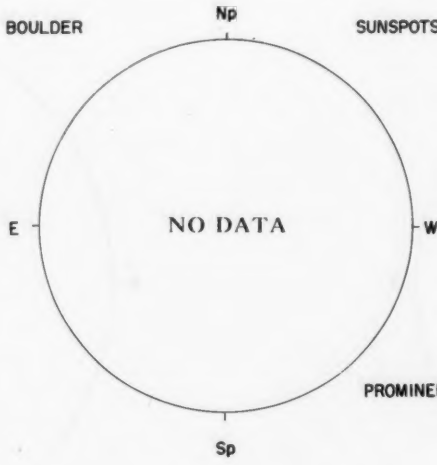


22

SACRAMENTO PEAK



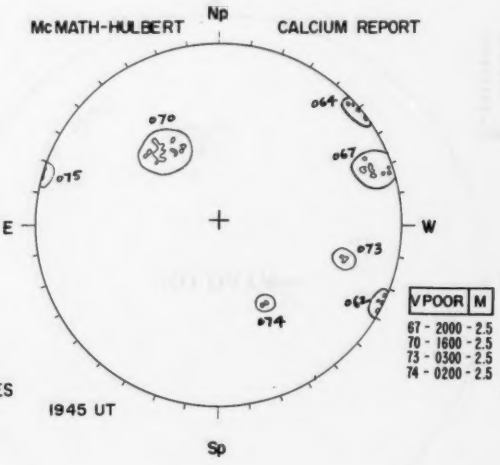
BOULDER



SUNSPOTS

McMATH-HULBERT

CALCIUM REPORT



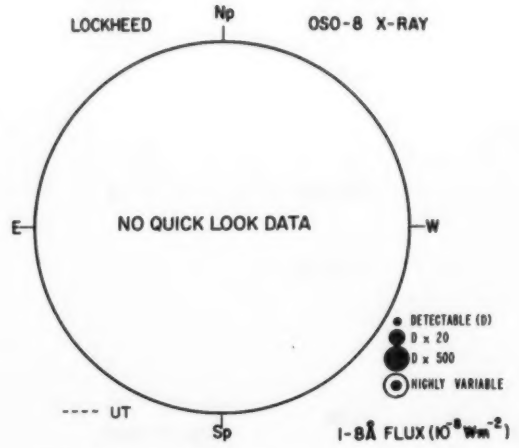
PROMINENCES

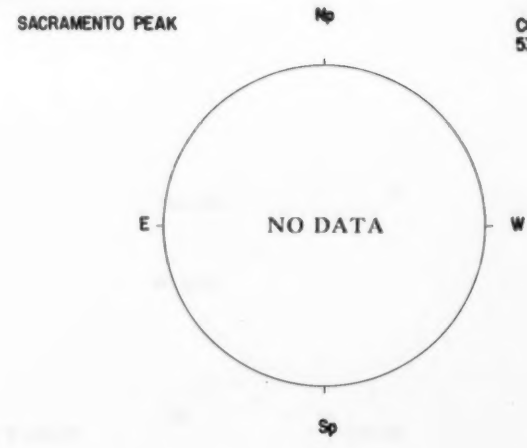
1945 UT

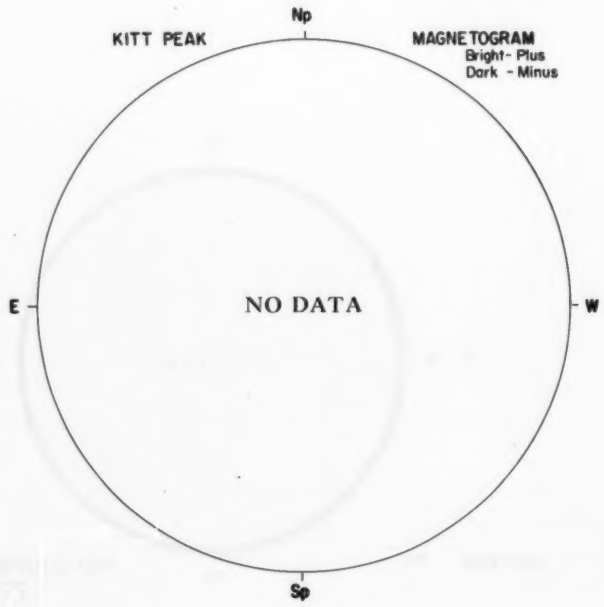
NOSC LA POSTA

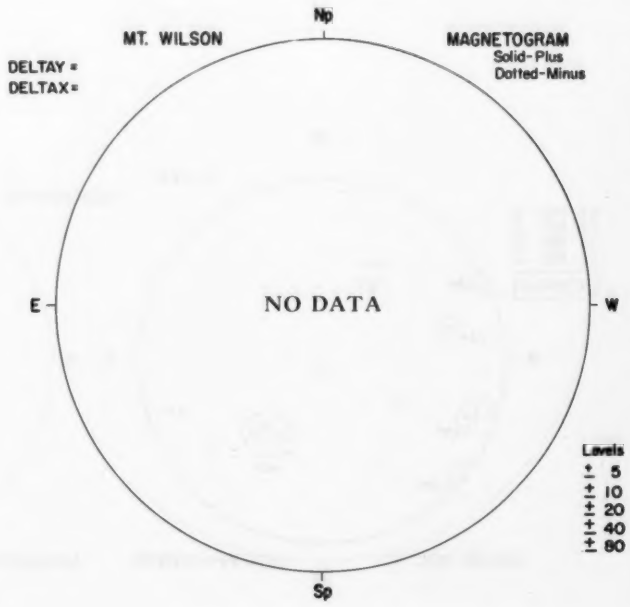
NOSC LA POSTA

DECEMBER 23, 1977 (P = 6.53, B_o = -1.94, L_o = 338.87)



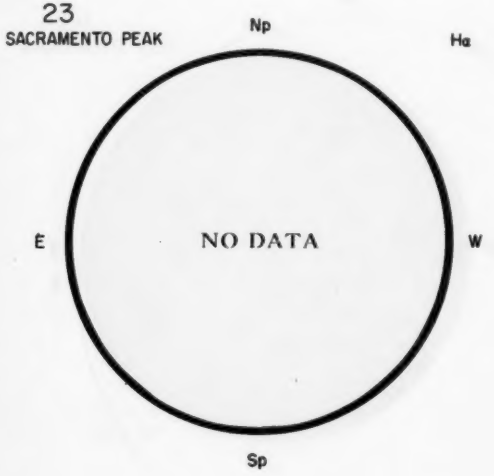




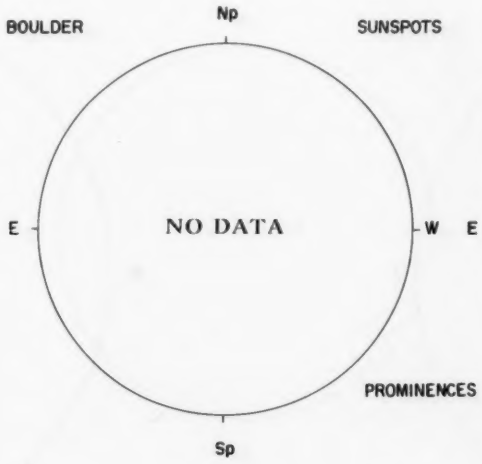


23

SACRAMENTO PEAK

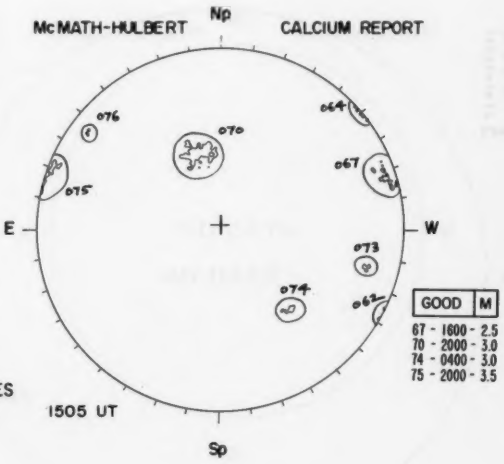


Hα BOULDER



SUNSPOTS

McMATH-HULBERT



CALCIUM REPORT

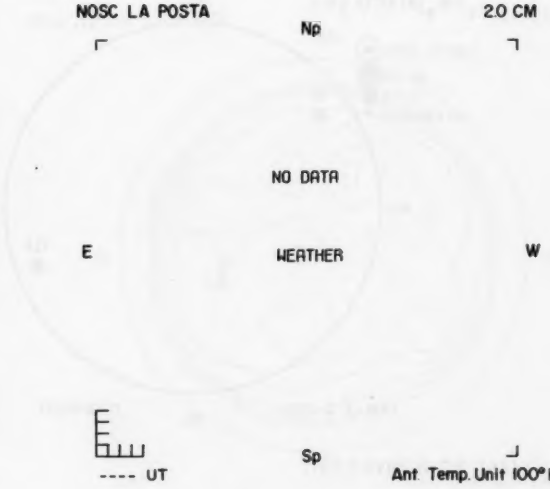
GOOD	M

67 - 1600 - 2.5
70 - 2000 - 3.0
74 - 0400 - 3.0
75 - 2000 - 3.5

PROMINENCES

1505 UT

NOSC LA POSTA

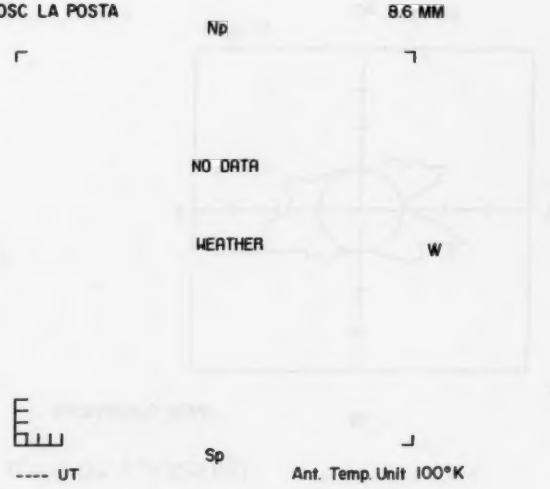


2.0 CM

---- UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

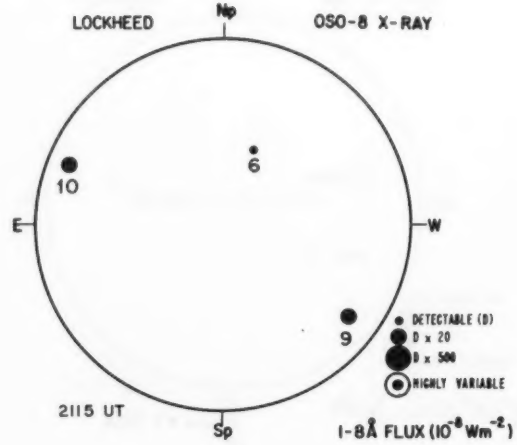


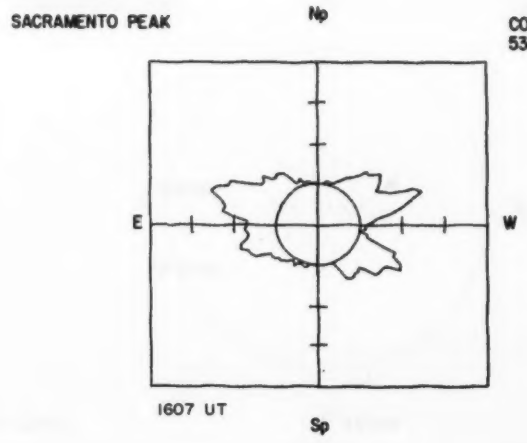
8.6 MM

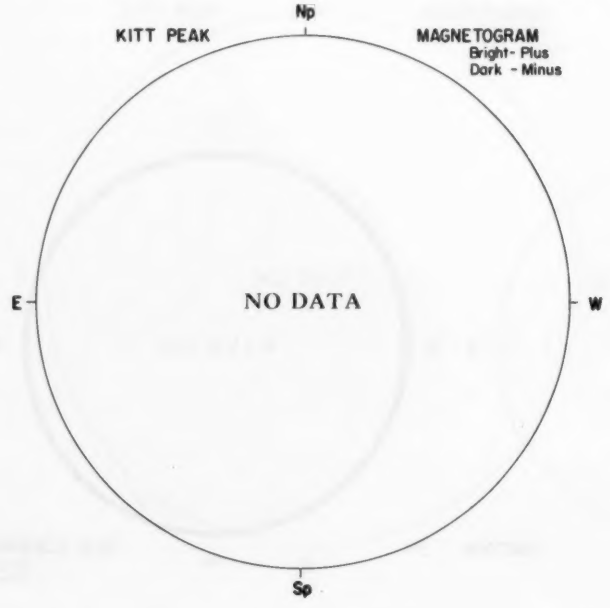
---- UT

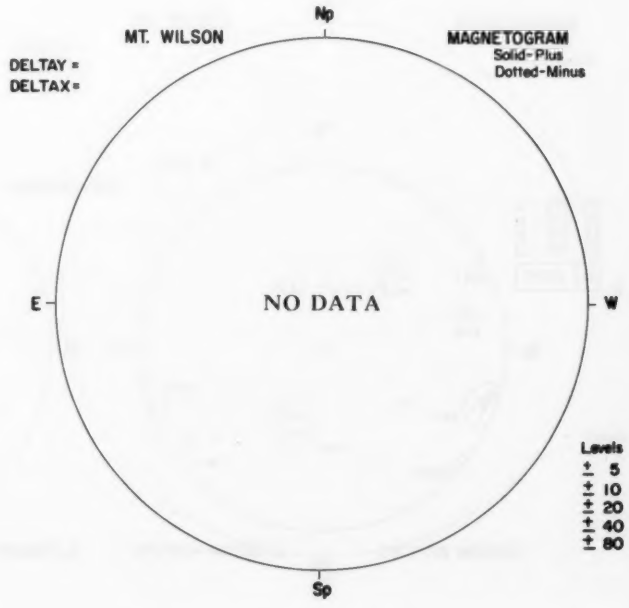
Ant. Temp. Unit 100°K

DECEMBER 24, 1977 (P = 6.06, B_o = -2.07, L_o = 325.69)

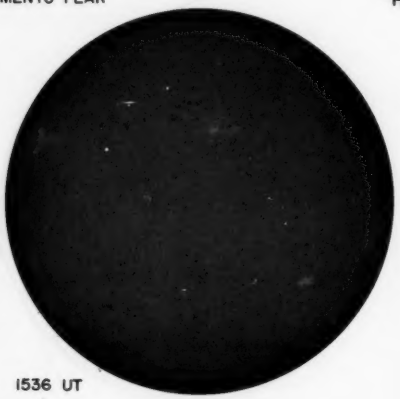






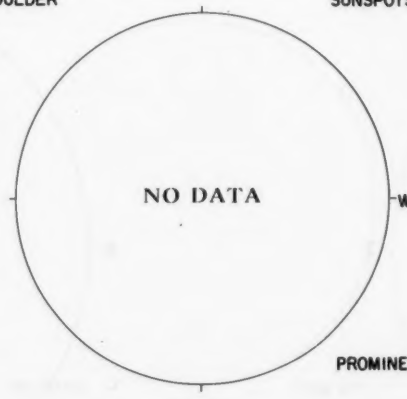


SACRAMENTO PEAK



1536 UT

Hα BOULDER



SUNSPOTS

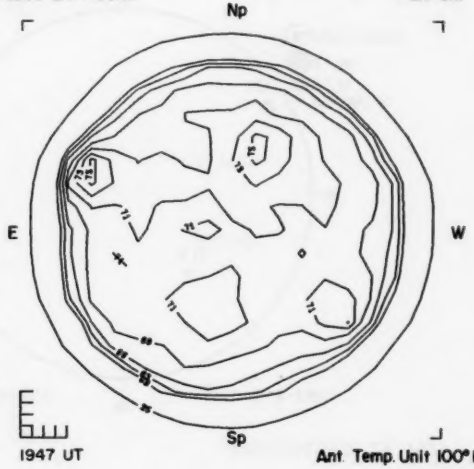
PROMINENCES

McMATH-HULBERT

CALCIUM REPORT

NOSC LA POSTA

2.0 CM

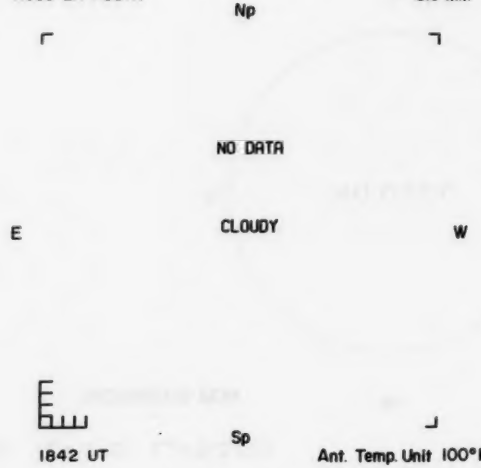


1947 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

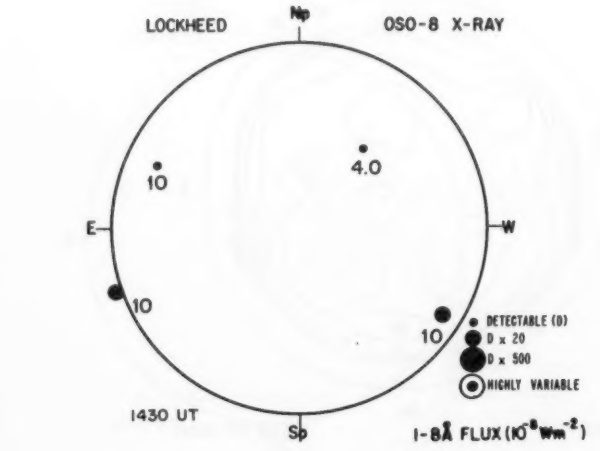
8.6 MM

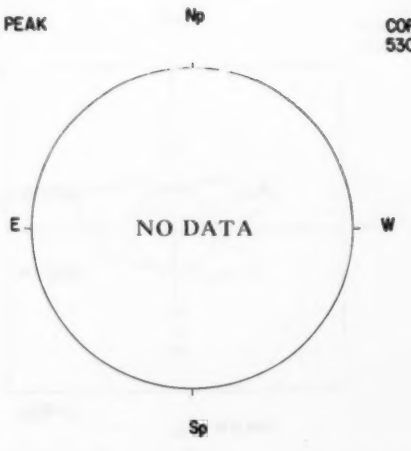


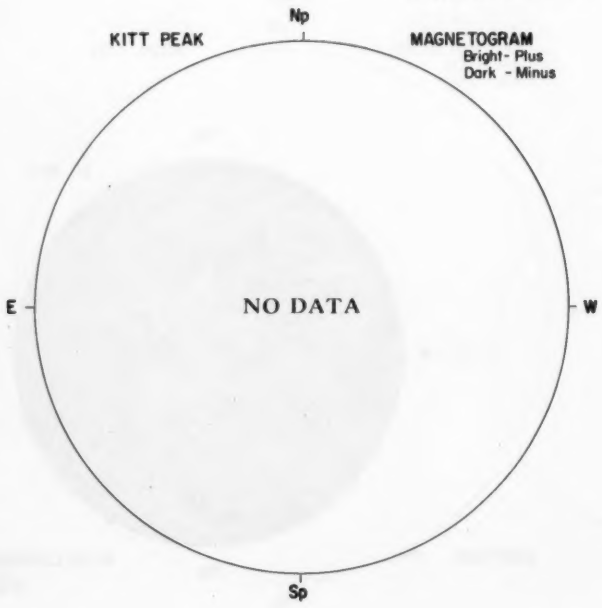
1842 UT

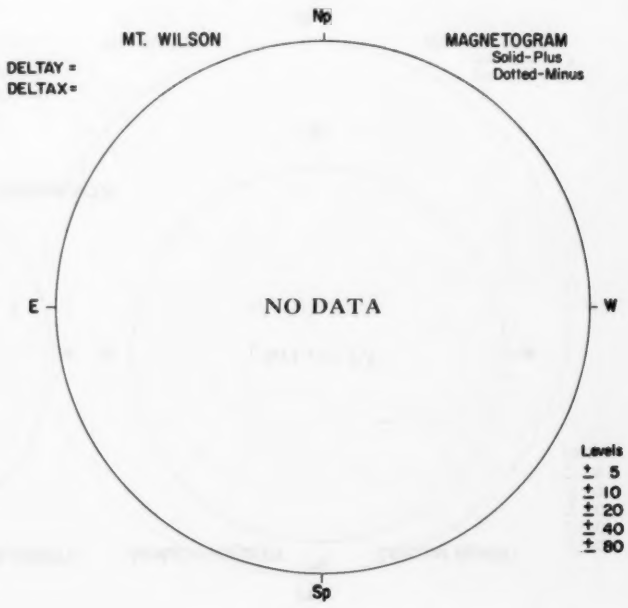
Ant. Temp. Unit 100°K

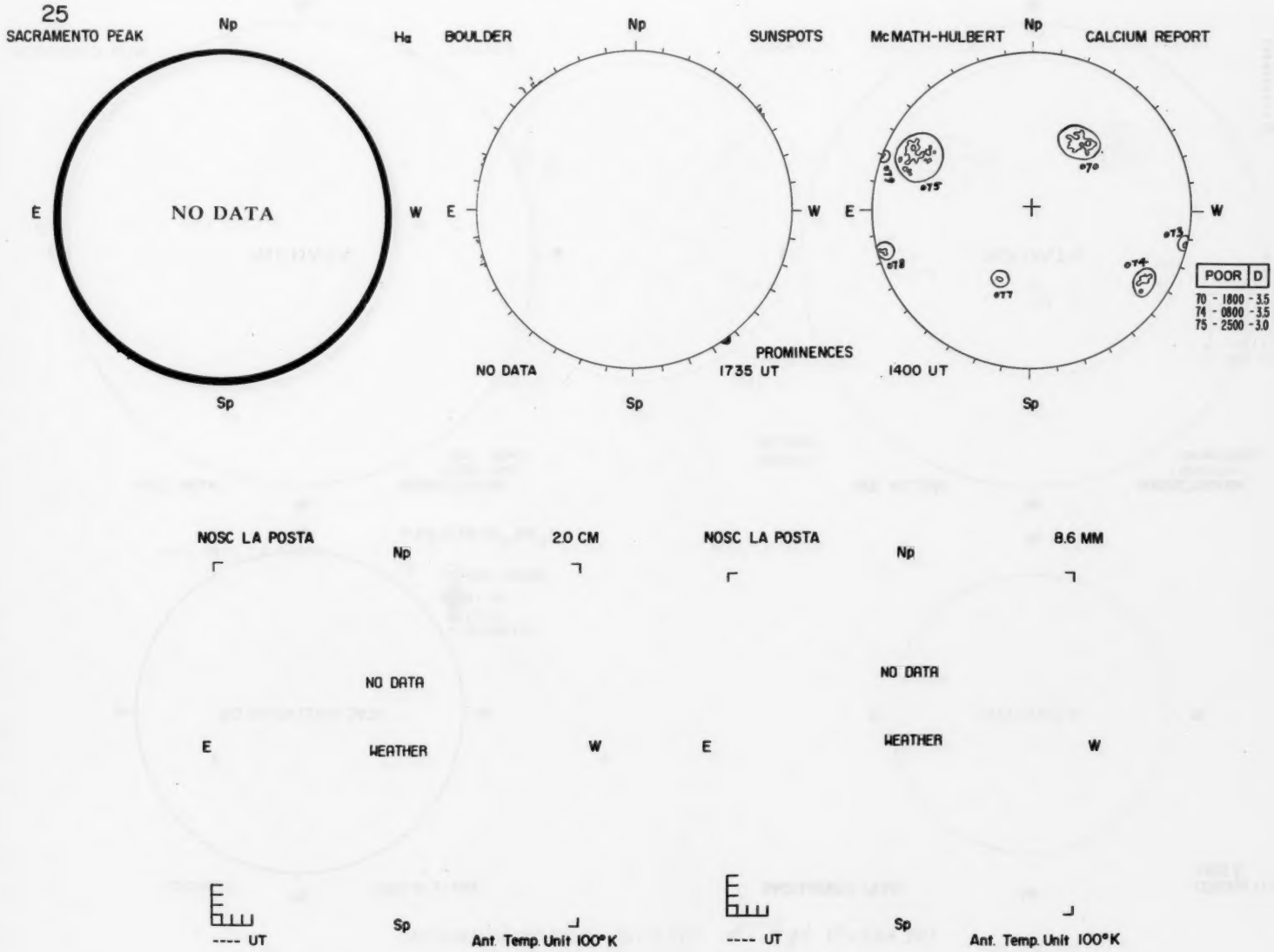
DECEMBER 25, 1977 (P = 5.58, B_o = -2.19, L_o = 312.52)





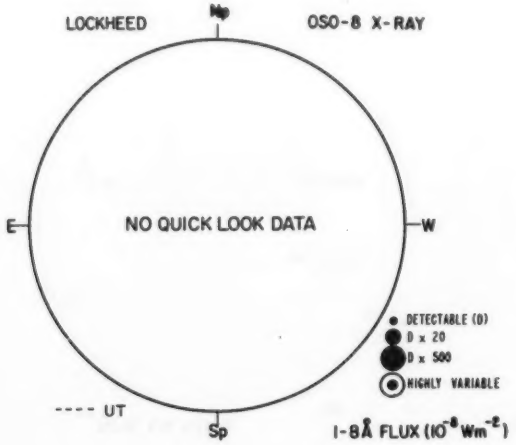




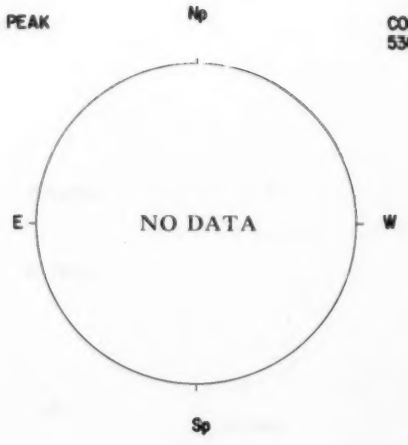

25
SACRAMENTO PEAK
Np
Hα
E
NO DATA
W
Sp
BOULDER
Np
SUNSPOTS
E
W
NO DATA
PROMINENCES
1735 UT
Sp
McMATH-HULBERT
Np
CALCIUM REPORT
E
W
1400 UT
Sp
POOR D
70 - 1800 - 3.5
74 - 0800 - 3.5
75 - 2500 - 3.0
NOSC LA POSTA
Np
2.0 CM
NO DATA
E
WEATHER
W
Sp
---- UT
Ant. Temp. Unit 100°K
NOSC LA POSTA
Np
8.6 MM
NO DATA
E
WEATHER
W
Sp
---- UT
Ant. Temp. Unit 100°K

DECEMBER 26, 1977 (P = 5.10, B_o = -2.31, L_o = 299.35)

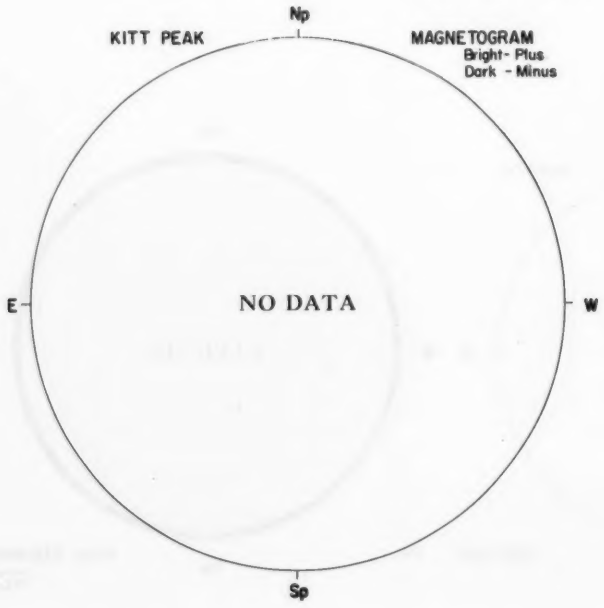
LOCKHEED OSO-8 X-RAY



SACRAMENTO PEAK CORONA (1.15 $R_\odot$) 5303 Å

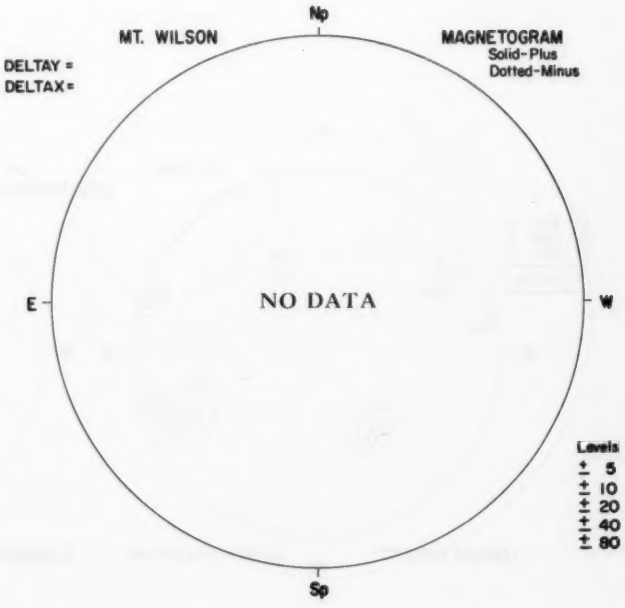


KITT PEAK MAGNETOGRAM Bright- Plus Dark - Minus

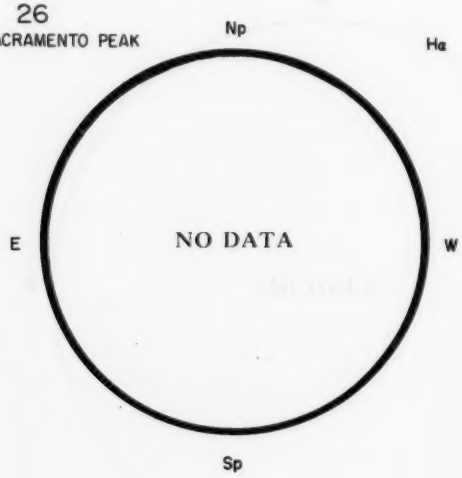


MT. WILSON MAGNETOGRAM Solid- Plus Dotted- Minus

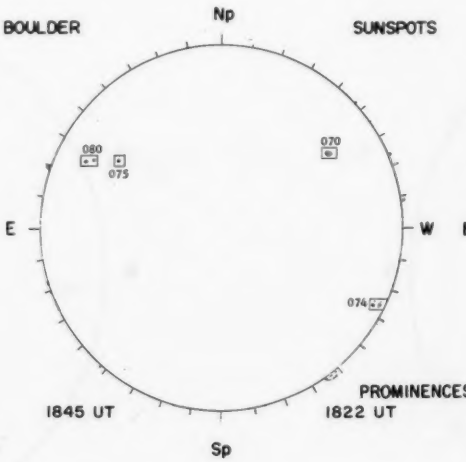
DELTAY =
DELTAX =



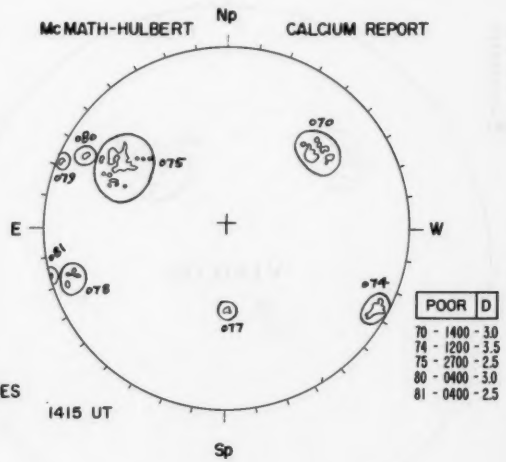
SACRAMENTO PEAK



BOULDER

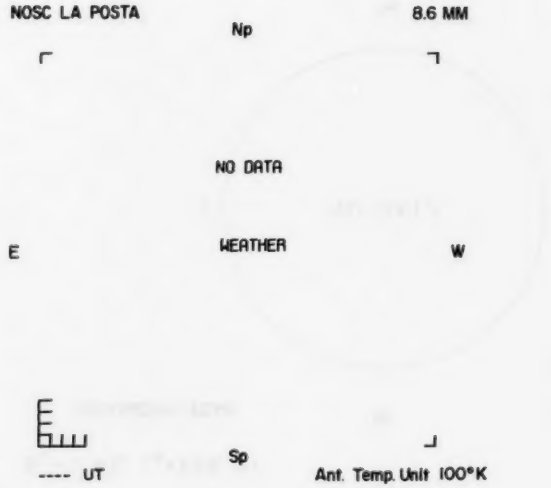


McMATH-HULBERT



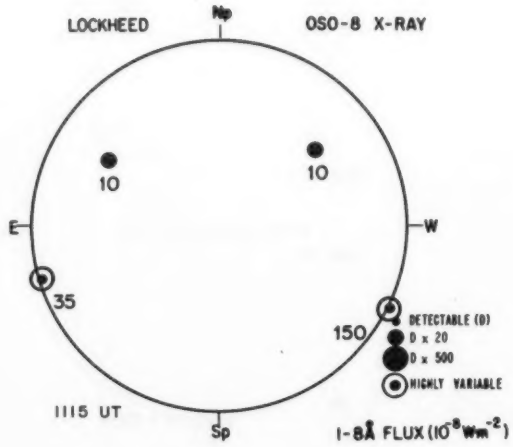
NOSC LA POSTA

NOSC LA POSTA



DECEMBER 27, 1977 (P = 4.62, B_o = -2.43, L_o = 286.18)

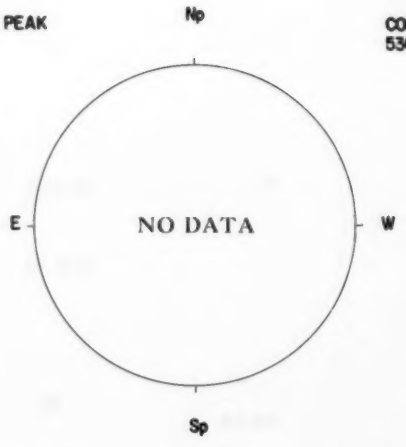
LOCKHEED OSO-8 X-RAY



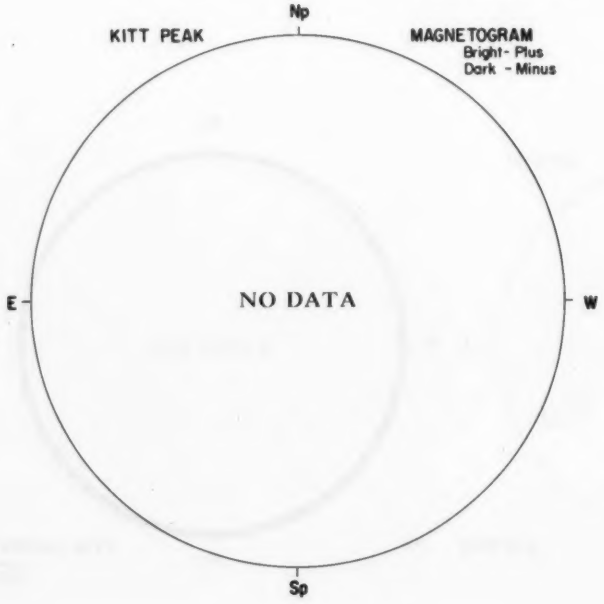
1115 UT

1-8Å FLUX (10^{-8} Wm^{-2})

SACRAMENTO PEAK CORONA (1.15 R_o) 5303 Å

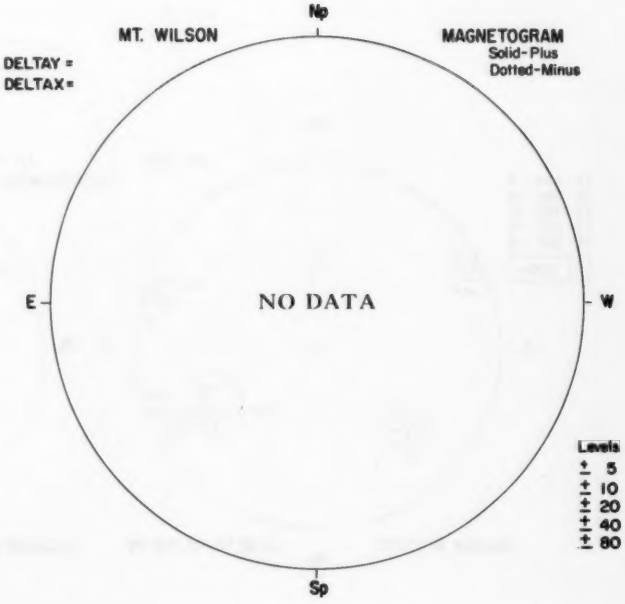


KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus



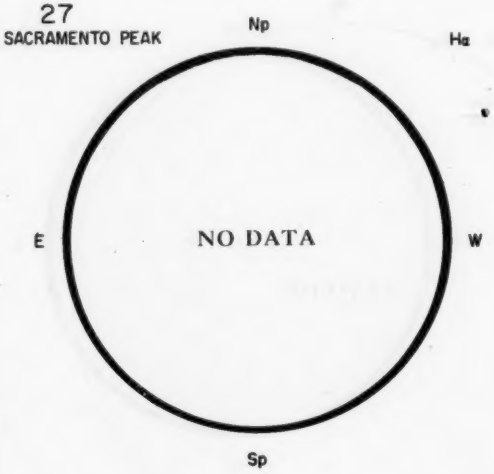
MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus

DELTAY =
DELTAX =

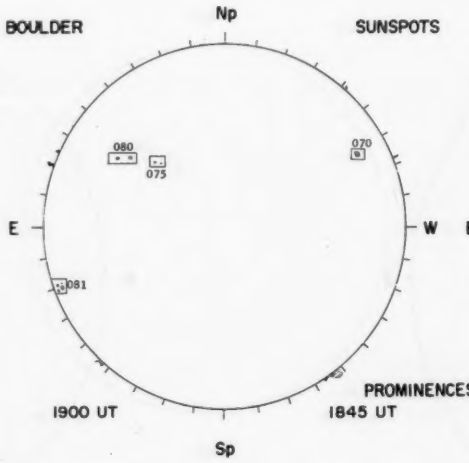


27

SACRAMENTO PEAK

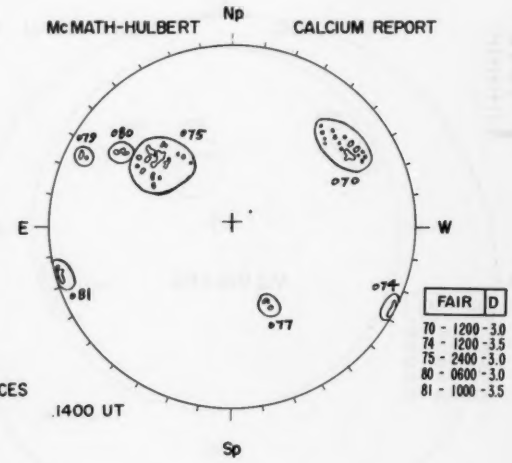


Hα BOULDER



1900 UT

SUNSPOTS



1845 UT

McMATH-HULBERT

CALCIUM REPORT

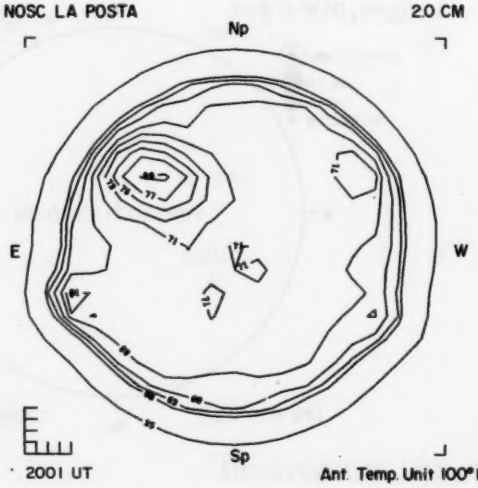
PROMINENCES

1400 UT

FAIR	D
70 - 1200 - 3.0	
74 - 1200 - 3.5	
75 - 2400 - 3.0	
80 - 0600 - 3.0	
81 - 1000 - 3.5	

NOSC LA POSTA

2.0 CM

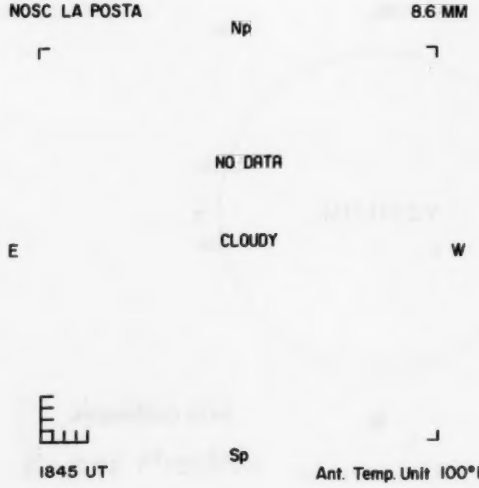


2001 UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

8.6 MM

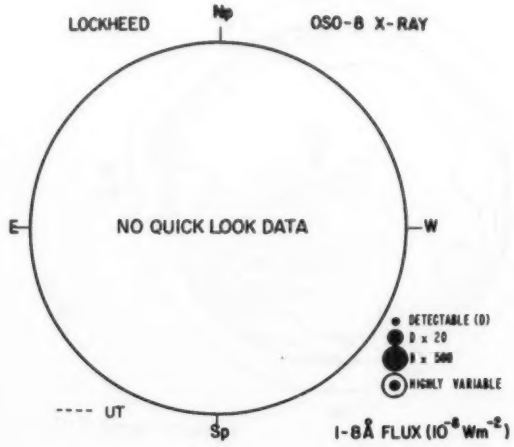


1845 UT

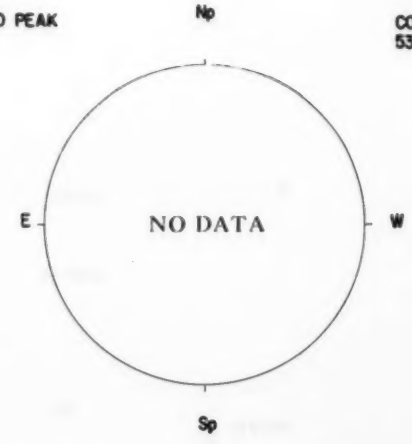
Ant. Temp. Unit 100°K

DECEMBER 28, 1977 (P = 4.13, B_0 = -2.55, L_0 = 273.01)

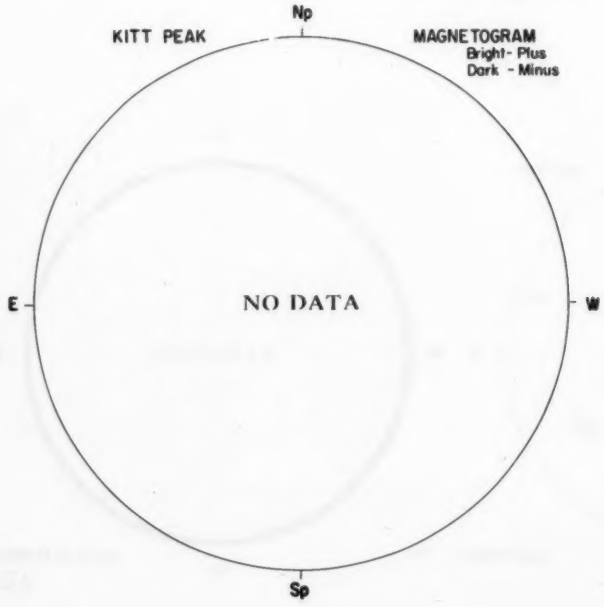
LOCKHEED OSO-8 X-RAY



SACRAMENTO PEAK CORONA (1.15 $R_\odot$) 5303 Å

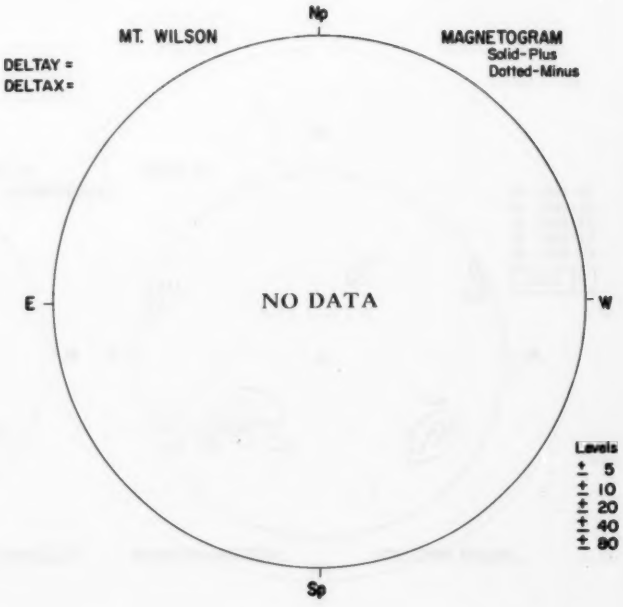


KITT PEAK MAGNETOGRAM Bright - Plus Dark - Minus



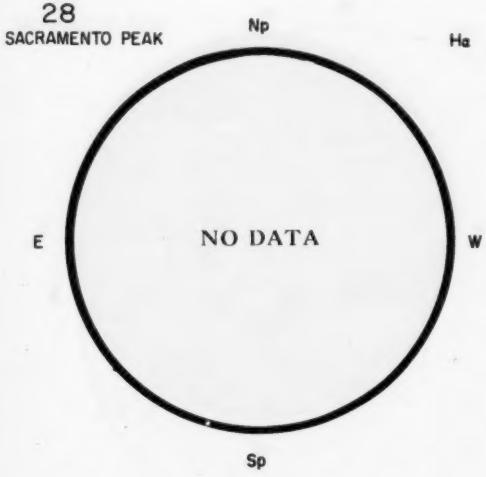
MT. WILSON MAGNETOGRAM Solid - Plus Dotted - Minus

DELTAY =
DELTAX =

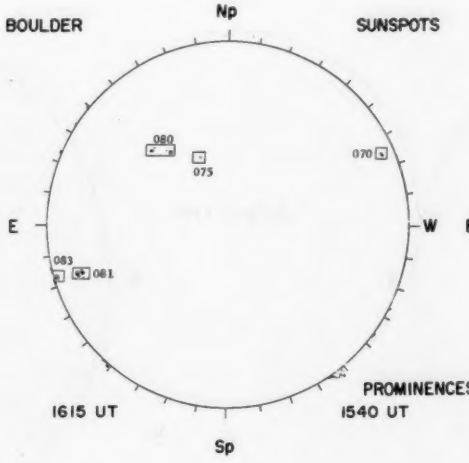


28

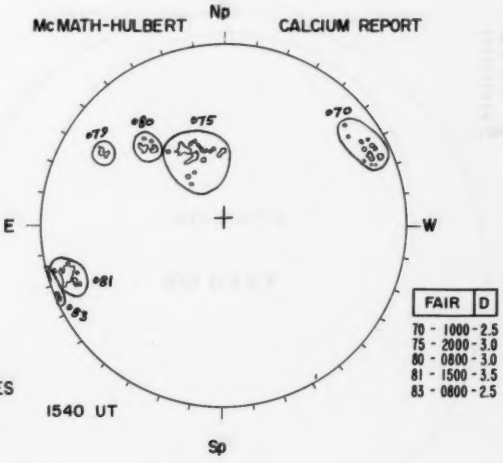
SACRAMENTO PEAK



BOULDER

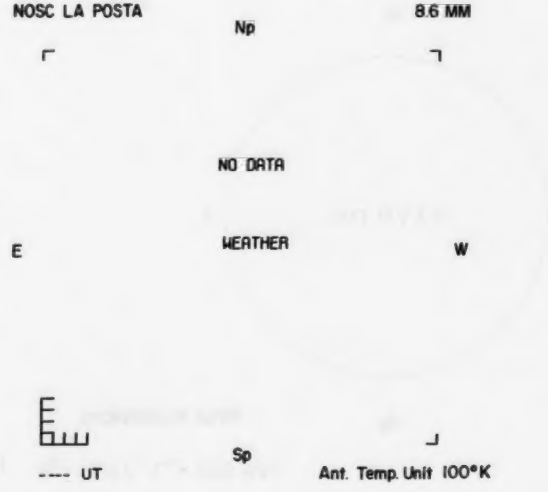


McMATH-HULBERT



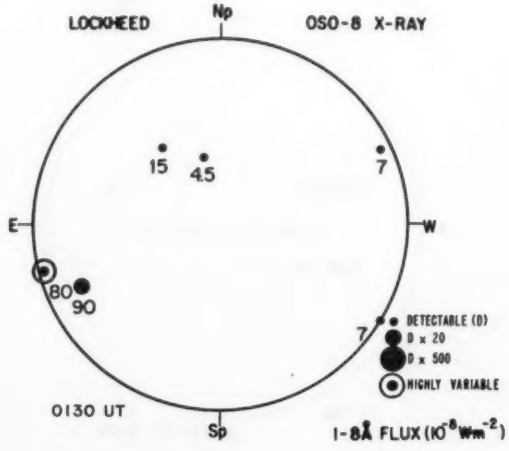
NOSC LA POSTA

NOSC LA POSTA



DECEMBER 29, 1977 (P = 3.65, B_o = -2.67, L_o = 259.83)

LOCKHEED OSO-8 X-RAY

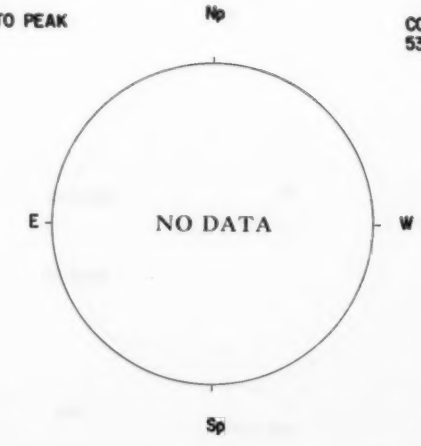


0130 UT

I-8Å FLUX (10^{-8} Wm^{-2})

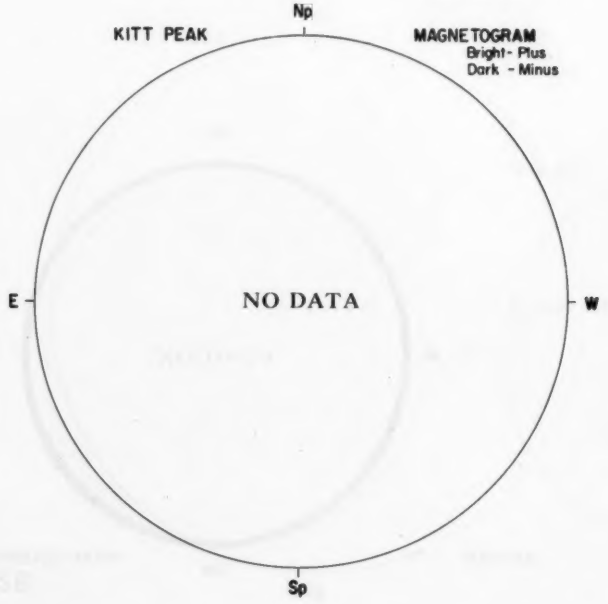
SACRAMENTO PEAK

CORONA (1.15 $R_\odot$)
5303 Å



KITT PEAK

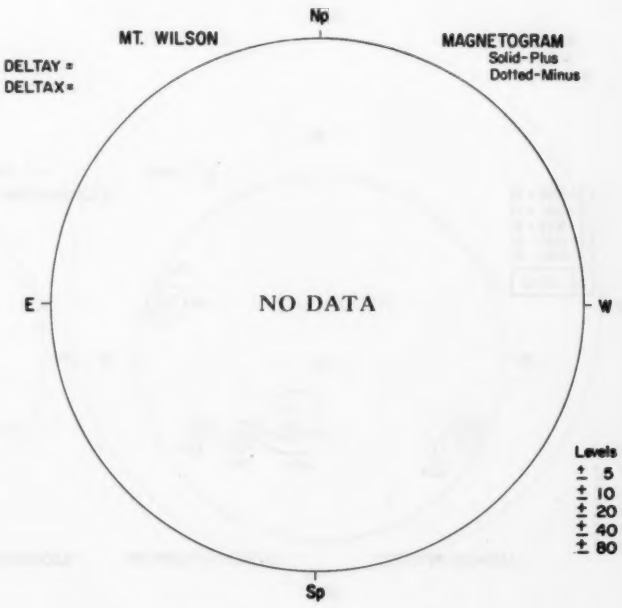
MAGNETOGRAM
Bright - Plus
Dark - Minus



MT. WILSON

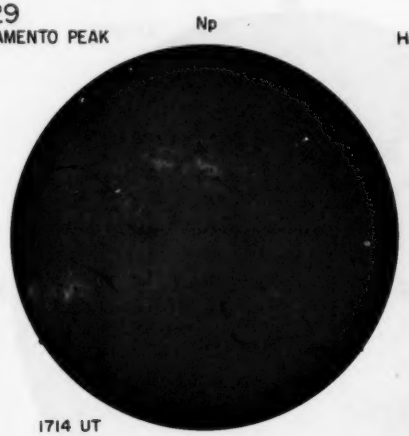
DELTAY =
DELTAX =

MAGNETOGRAM
Solid - Plus
Dotted - Minus

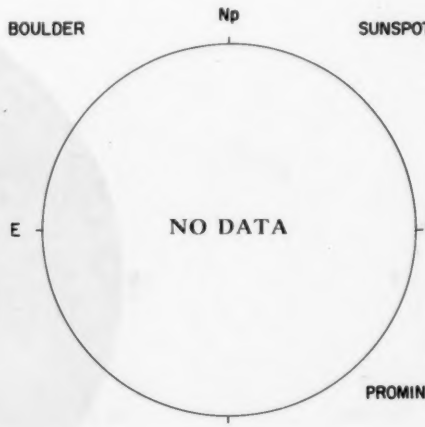


29

SACRAMENTO PEAK



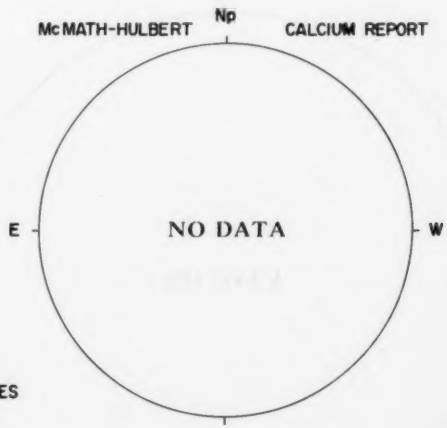
Hα BOULDER



SUNSPOTS

PROMINENCES

McMATH-HULBERT



CALCIUM REPORT

NOSC LA POSTA

2.0 CM

---- UT

Ant. Temp. Unit 100°K

NOSC LA POSTA

8.6 MM

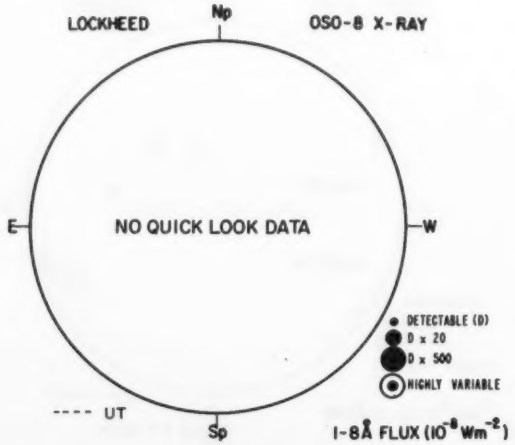
---- UT

Ant. Temp. Unit 100°K

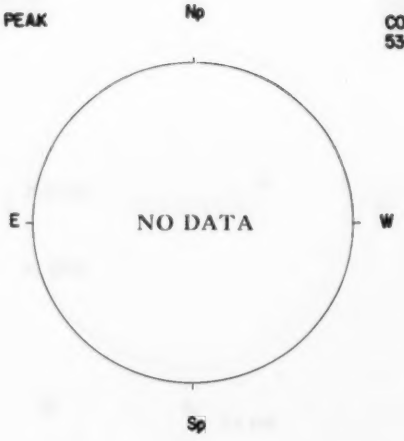
95
Dec 77

DECEMBER 30, 1977 (P = 3.17, B_0 = -2.79, L_0 = 246.66)

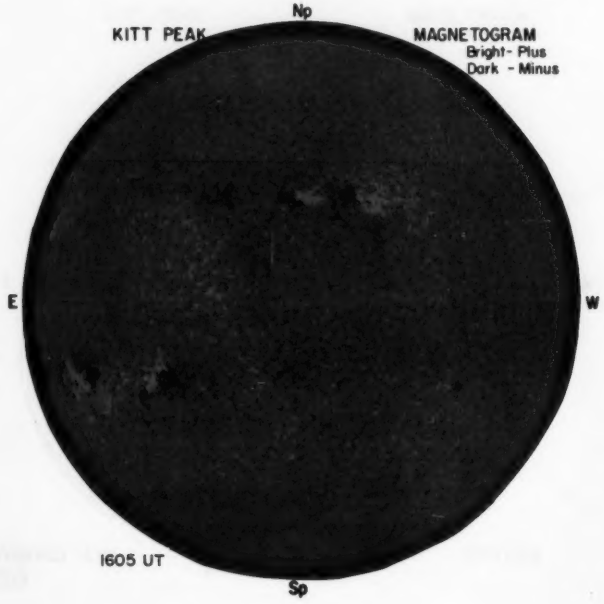
LOCKHEED OSO-8 X-RAY



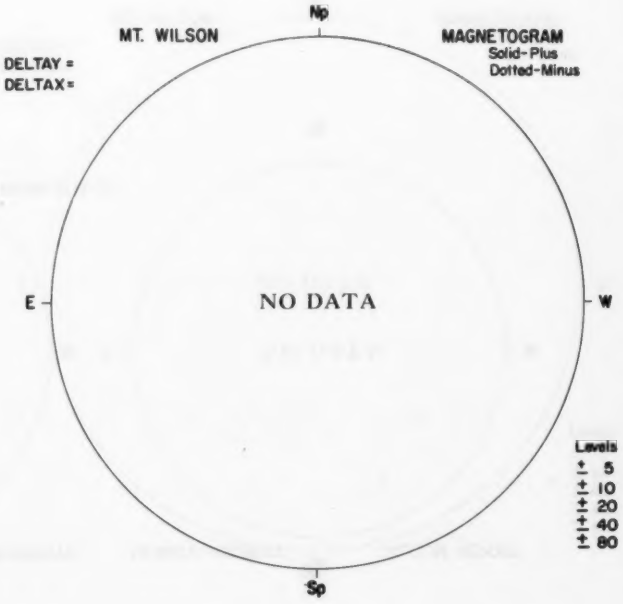
SACRAMENTO PEAK CORONA (1.15 $R_\odot$) 5303 Å



KITT PEAK MAGNETOGRAM
Bright - Plus
Dark - Minus

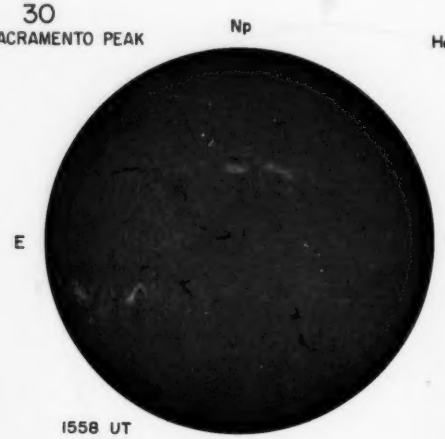


MT. WILSON MAGNETOGRAM
Solid - Plus
Dotted - Minus
DELTAY =
DELTAX =



30

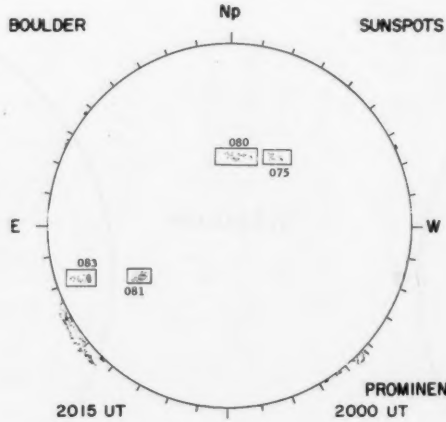
SACRAMENTO PEAK



Hα

1558 UT

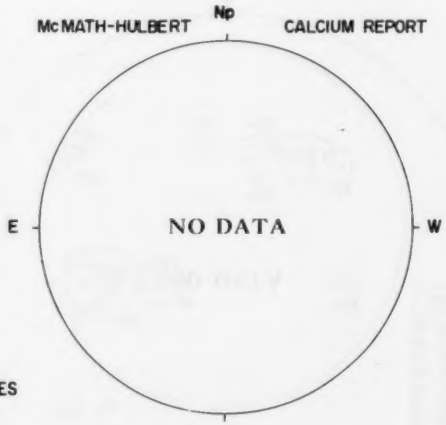
BOULDER



SUNSPOTS

2015 UT

McMATH-HULBERT

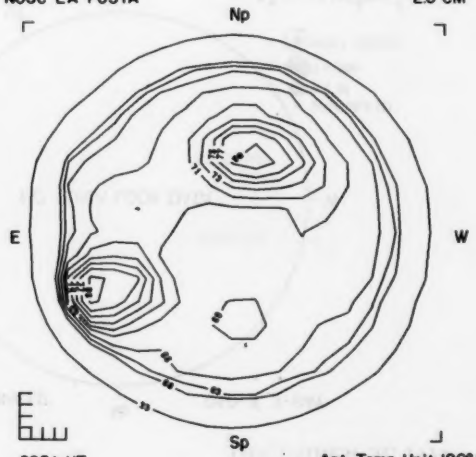


CALCIUM REPORT

PROMINENCES

2000 UT

NOSC LA POSTA



2.0 CM

2051 UT

Ant. Temp. Unit 100°K

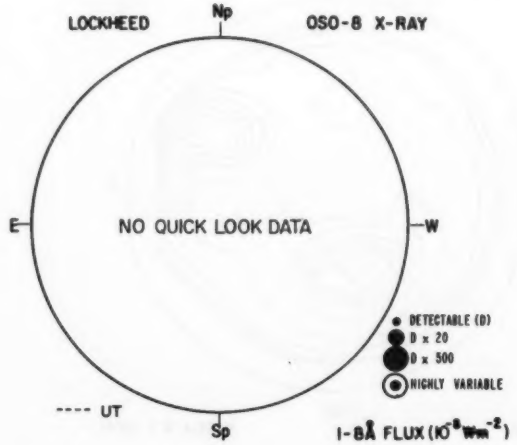
NOSC LA POSTA

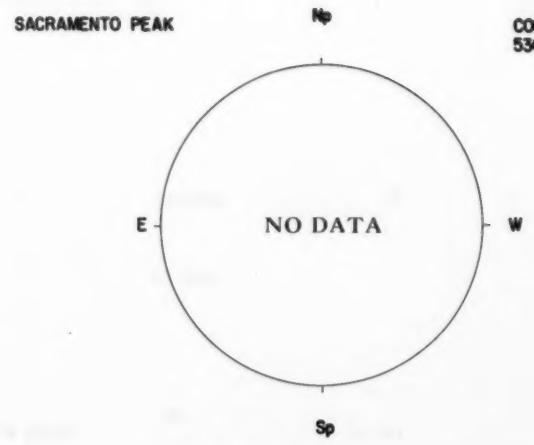
8.6 MM

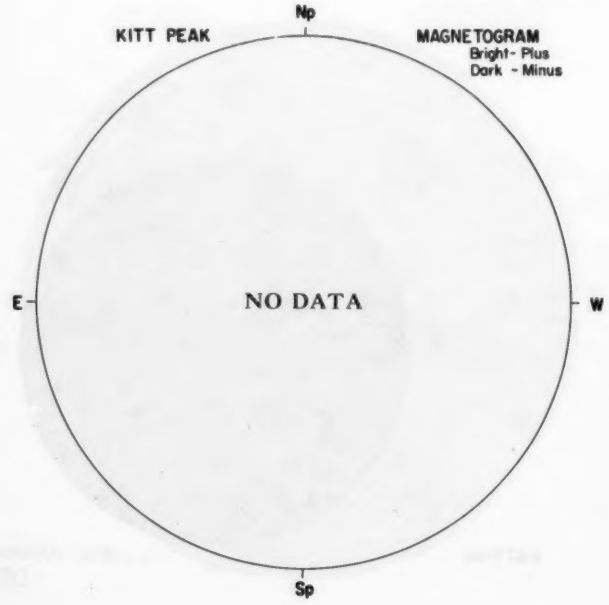
---- UT

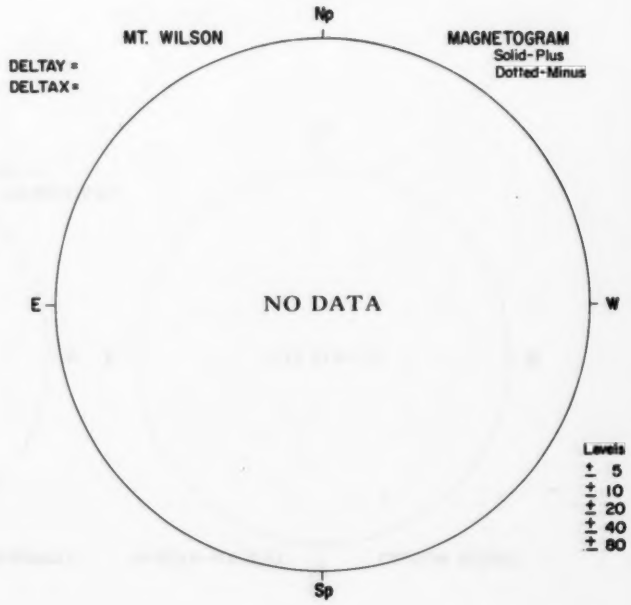
Ant. Temp. Unit 100°K

DECEMBER 31, 1977 (P=2.68, B_o=-2.91, L_o=233.49)



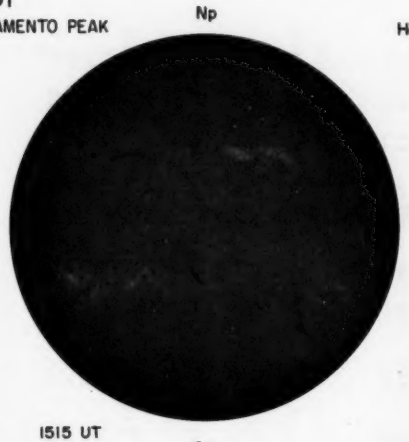






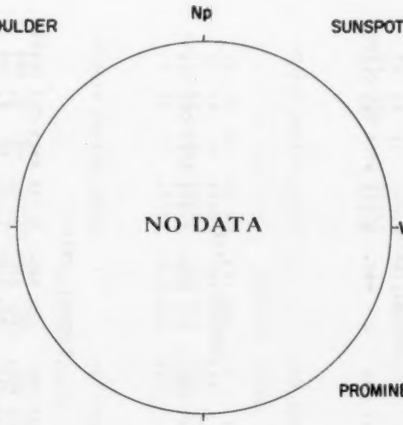
31

SACRAMENTO PEAK



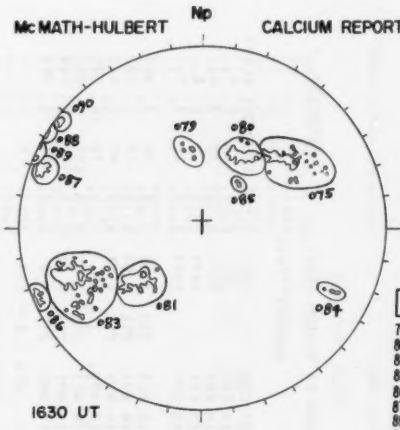
1515 UT

Hα BOULDER



SUNSPOTS

McMATH-HULBERT



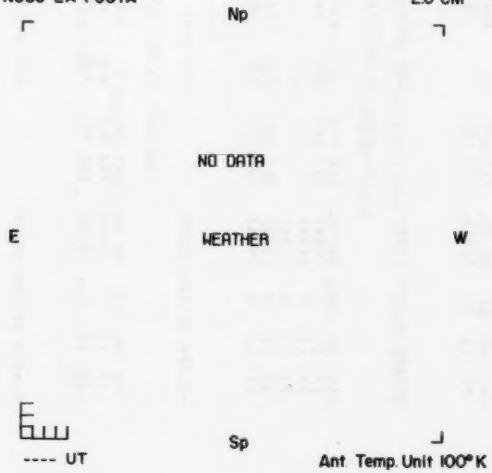
1630 UT

CALCIUM REPORT

POOR	S
75 - 2500 - 2.5	
80 - 2000 - 3.0	
81 - 2400 - 3.0	
83 - 3900 - 3.5	
86 - 1800 - 3.0	
87 - 2000 - 3.5	
89 - 0800 - 2.5	
90 - 0800 - 2.5	

PROMINENCES

NOSC LA POSTA



2.0 CM

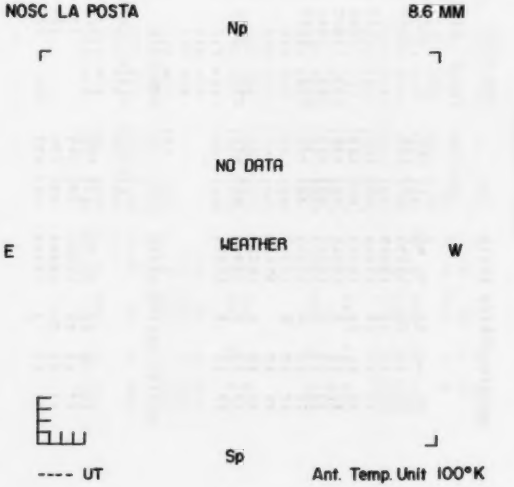
NO DATA

WEATHER

---- UT

Ant. Temp. Unit 100°K

NOSC LA POSTA



8.6 MM

NO DATA

WEATHER

---- UT

Ant. Temp. Unit 100°K

REGIONS OF SOLAR ACTIVITY

DECEMBER 1977

MCMATH REGION 15045 CMP DATE 1.6 RETURN OF REGION 15016 ROTATION 2

CALCIUM PLAGE DATA — SUNSPOT DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	11	26	15045	S27 E65		400	1.5									
77	11	28	15045	S27 E38		500	1.5									
77	11	29	15045	S27 E24		400	1.0									
77	12	2	15045	S27 W15	260	200	1.0									

MCMATH REGION 15044 CMP DATE 2.1 RETURN OF REGION 15017 ROTATION 2

CALCIUM PLAGE DATA — SUNSPOT DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	11	26	15044	N22 E75		2100	2.5	19898	N18 E80		X	2	B	10	1	A
77	11	27	15044					19899	N18 E64		(AP)	2	B	30	2	B
77	11	28	15044	N22 E47		2600	3.0	19898	N18 E51		(AP)	2	B	0	1	A
77	11	29	15044	N22 E33		2200	2.5	19898	N18 E35		(BY)	3	B	20	3	B
77	12	2	15044	N21 W08	253	2500	2.5									
77	12	3	15044	N21 W20	252	2100	3.0	19901	N16 W18	250	(B)	4	H	30	3	BXO
77	12	4	15044	N21 W32	253	2100	3.0	19901	N16 W31	251	(B)	4	B	70	4	DRO
77	12	5	15044					19901	N16 W45	252	(B)	4	H	60	7	CAO
77	12		15044						N17 W35				H	50	10	DRO
77	12	6	15044					19901	N16 W58	251	(D)	5	R	130	4	DAO
77	12	7	15044	N19 W72	251	2600	3.5	19901	N17 W71	251	(D)	4	B	390	9	DKO
77	12	8	15044					19901	N17 W85	251	B	2	R	200	8	DKI

MCMATH REGION 15046 CMP DATE 2.1

CALCIUM PLAGE DATA — SUNSPOT DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	11	28	15046	N03 E49		100	1.5									
77	11	29	15046	N02 E34		100	2.0									
77	12	2	15046	N02 W08	253	200	1.5									

MCMATH REGION 15048 CMP DATE 3.2

CALCIUM PLAGE DATA — SUNSPOT DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	11	29	15048	S39 E45		100	1.5									

MCMATH REGION 15057 CMP DATE 4.2

CALCIUM PLAGE DATA — SUNSPOT DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	12	4	15057	N17 W05	226	400	3.0	19902	N16 W06	226	(BP)	4	B	30	2	CRO
77	12	5	15057					19902	N16 W19	226	(B)	4	H	50	8	CRO
77	12	6	15057					19902	N17 W33	226	(BP)	4	R	20	7	CRO
77	12	7	15057	N17 W44	223	500	2.5									
77	12	9	15057	N18 W71	225	300	1.0									

MCMATH REGION 15059 CMP DATE 4.3

CALCIUM PLAGE DATA — SUNSPOT DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	12	7	15059	S19 W45	224	200	2.0									
77	12	9	15059	S19 W71	225	300	2.0									

MCMATH REGION 15047 CMP DATE 5.4 RETURN OF REGION 15021 ROTATION 4

CALCIUM PLAGE DATA — SUNSPOT DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	11	28	15047	N10 E80		400	1.0									
77	11	29	15047	N10 E68		1700	1.5									
77	12	2	15047	N12 E33	212	3000	2.0									
77	12	3	15047	N12 E20	212	2800	2.0									
77	12	4	15047	N12 E10	211	3200	2.0									
77	12	7	15047	N12 W31	210	2500	1.5									
77	12	9	15047	N12 W57	211	2500	1.5									

(Cont'd)

REGIONS OF SOLAR ACTIVITY

DECEMBER 1977

MCMATH REGION 15047 (CONT) CMP DATE 5.4 RETURN OF REGION 15021 ROTATION 4

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	12	10	15047	N12 W70	210	2000	1.0									

MCMATH REGION 15049 CMP DATE 6.6 RETURN OF REGION 15032 ROTATION 2

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	11	29	15049	S20 E84		900	2.5						B	70	1	H
77	11	30	15049					19899	S21 E72		(AP)	4	B	420	6	E
77	12	1	15049					19899	S20 E55	204	(D)	4				
77	12	2	15049	S20 E47	198	3000	3.5	19899	S21 E45	201	(BP)	4	R	290	18	DSO
77	12	3	15049	S22 E37	195	3300	3.5	19899	S21 E32	200	(D)	5	H	230	14	DAO
77	12	4	15049					19899	S21 E18	202	(BP)	5	B	270	4	DKO
77	12	5	15049					19899	S22 E08	199	(BP)	5				
77	12		15049					19903	S20 E02	205	(BP)	5	H	240	21	EHO
77	12		15049					19904	S27 E19	188	(AF)	3	H	30	3	BXO
77	12	6	15049					19899	S22 W04	197	(BP)	5	R	310	13	EHO
77	12		15049					19904	S27 E06	187	AP	1				
77	12		15049					19903	S19 W12	205	(BP)	5				
77	12	7	15049	S23 W15	194	3300	3.0	19899	S22 W17	197	(BP)	5				
77	12		15049					19903	S19 W25	205	(BY)	5	B	310	5	ESO
77	12	8	15049					19899	S22 W31	197	(AP)	5	R	260	20	ESO
77	12		15049					19903	S19 W38	204	(BP)	5				
77	12	9	15049	S23 W40	194	3000	3.0		S16 W38				B	20	2	BXO
77	12		15049						S20 W50				B	150	2	DSO
77	12	10	15049	S23 W53	193	2500	2.5	19899	S22 W57	197	(AP)	4	B	120	2	DSO
77	12		15049					19903	S20 W65	205	(AP)	4				
77	12		15049					19906	S17 W50	190	(B)	3	B	30	6	BXO
77	12	11	15049	S23 W68	196	2500	2.5	19899	S23 W70	198	(AP)	4				
77	12		15049					19903	S21 W78	206	(AP)	4	B	230	2	DSO
77	12		15049					19906	S18 W63	191	(B)	3	B	20	3	BXO

MCMATH REGION 15053 CMP DATE 7.1

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	12	2	15053	N18 E58	187	600	2.5									
77	12	3	15053	N18 E45	187	500	2.5									
77	12	4	15053	N18 E33	188	400	2.5									
77	12	7	15053	N18 W08	187	200	1.0									

MCMATH REGION 15054 CMP DATE 8.5 RETURN OF REGION 15024 ROTATION 3

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	12	2	15054	N30 E76	169	600	1.5									
77	12	3	15054	N28 E64	168	500	2.0									
77	12	4	15054	N30 E52	169	500	2.0									
77	12	7	15054	N30 E10	169	400	1.5									
77	12	9	15054	N29 W16	170	300	1.5									
77	12	10	15054	N29 W29	169	300	1.0									
77	12	11	15054	N29 W41	169	200	1.0									

MCMATH REGION 15065 CMP DATE 8.8

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	12	11	15065	N17 W38	166	200	2.0									

MCMATH REGION 15060 CMP DATE 9.2

			CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	12	9	15060	N01 W06	160	100	2.5		N02 W08				B	20	2	BXO
77	12	10	15060	N01 W20	160	500	2.5	19907	N02 W19	159	(B)	4	B	20	5	BXO
77	12	11	15060	N01 W33	161	400	2.0									

REGIONS OF SOLAR ACTIVITY

DECEMBER 1977

MCMATH REGION 15055 CMP DATE 10.0 RETURN OF PART OF REGION 15025 ROTATION 4

CALCIUM PLAGE DATA								SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	NW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	12	3	15055	N24 E80	152	500	1.0									
77	12	4	15055	N25 E70	151	900	1.5									
77	12	7	15055	N25 E30	149	700	1.5									
77	12	9	15055	N25 E05	149	600	1.5									
77	12	10	15055	N25 W09	149	400	1.0									
77	12	11	15055	N25 W22	150	600	1.5									

MCMATH REGION 15056 CMP DATE 11.2 RETURN OF REGION 15026 ROTATION 2

CALCIUM PLAGE DATA								SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	NW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	12	3	15056	S24 E85	147	600	1.0									
77	12	4	15056	S23 E74	147	500	1.5									
77	12	5	15056					19905	S27 E75	132	X	2	H	90	4	BXO
77	12	6	15056					19905	S27 E60	133	(9)	3	R	30	7	BXO
77	12	7	15056	S25 E44	135	2500	3.5	19905	S26 E47	133	(8)	4	B	110	11	EAI
77	12	8	15056					19905	S26 E32	134	(9)	4	R	150	36	EAI
77	12	9	15056	S25 E20	134	3000	3.5		S25 E15				B	340	11	EKO
77	12	10	15056	S25 E07	133	3500	3.5	19905	S25 E06	134	(Y)	5	B	540	49	FAI
77	12	11	15056	S25 W06	134	3300	3.5	19905	S26 W14	142	(D)	4	B	340	17	FKI
77	12		15056					19910	S28 W02	130	(BY)	4				
77	12	13	15056					19905	S26 W41	141	(AP)	4	H	250	8	EAI
77	12		15056					19910	S28 W29	129	(8)	4	H	300	20	FKI
77	12	14	15056					19905	S26 W55	142	(AP)	4	B	50	4	CSO
77	12		15056					19910	S27 W46	133	(AP)	4				
77	12	16	15056	S24 W70	132	3000	2.5	19905	S24 W82	143	AP	2	R	70	1	HSX
77	12	17	15056	S26 W83	131	2300	2.5									
77	12	18	15056	S26 W98	123	800	1.0									

MCMATH REGION 15069 CMP DATE 11.2

CALCIUM PLAGE DATA								SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	NW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	12	16	15069	N36 W71	133	300	1.0									

MCMATH REGION 15071 CMP DATE 12.9

CALCIUM PLAGE DATA								SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	NW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	12	18	15071	N22 W78	111	300	2.0									

MCMATH REGION 15061 CMP DATE 14.6

CALCIUM PLAGE DATA								SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	NW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	12	9	15061	N27 E68	86	900	3.5		N26 E58				B	60	2	BSO
77	12	10	15061	N27 E52	88	1200	3.0	19908	N25 E49	91	(BP)	5	B	90	8	DSO
77	12	11	15061	N27 E38	90	1000	3.0	19908	N25 E36	92	(BP)	4	B	80	5	DSO
77	12	13	15061					19908	N24 E10	90	(BP)	4	H	80	6	CSO
77	12	14	15061					19908	N24 W04	91	(AP)	4	B	20	3	HAX
77	12	16	15061	N27 W27	89	900	3.0		N25 W28				R	10	1	AXX
77	12	17	15061	N27 W40	88	900	2.5									
77	12	18	15061	N27 W57	90	1000	2.0									

MCMATH REGION 15066 CMP DATE 15.1

CALCIUM PLAGE DATA								SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	NW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	12	11	15066	S22 E45	83	200	2.0									

REGIONS OF SOLAR ACTIVITY

DECEMBER 1977

MCMATH REGION 15062 CMP DATE 16.6

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	12	9	15062	S21 E84	70	300	1.5									
77	12	10	15062	S23 E79	62	2200	2.5	19909	S22 E70	70	(AP)	4	B	10	1	AXX
77	12	11	15062	S25 E65	63	1800	2.5	19909	S22 E57	71	(AP)	3	B	10	1	AXX
77	12	13	15062					19909	S24 E17	83	(B)	3				
77	12	14	15062					19909	S24 E03	84	(AP)	2				
77	12	16	15062	S26 E00	62	1800	3.0	19912	S23 E03	58	(B)	4	R	60	7	DAO
77	12	17	15062	S26 W12	60	1800	2.5		S22 W02				M	50	5	CSO
77	12	18	15062	S26 W26	59	1800	2.5	19912	S23 W22	56	AP	2	M	40	4	CRO
77	12	19	15062					19912	S25 W35	57	(AP)	3	M	10	1	AXX
77	12	22	15062	S26 W75	56	500	1.5									
77	12	23	15062	S26 W87	57	200	1.0									

MCMATH REGION 15063 CMP DATE 17.0 RETURN OF REGION 15031 ROTATION 2

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	12	10	15063	N24 E84	56	300	1.0									
77	12	11	15063	N24 E70	58	600	1.0									
77	12	16	15063	N25 E05	57	700	1.5									
77	12	17	15063	N25 W08	56	700	1.5									
77	12	18	15063	N25 W21	54	900	1.0									

MCMATH REGION 15064 CMP DATE 17.5 RETURN OF REGION 15028 ROTATION 2

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	12	10	15064	N37 E85	55	500	1.5									
77	12	11	15064	N37 E72	56	1000	2.0									
77	12	16	15064	N37 E11	51	800	1.5									
77	12	17	15064	N37 W02	50	600	1.5									
77	12	18	15064	N37 W18	51	600	1.5									
77	12	22	15064	N37 W70	51	500	1.0									
77	12	23	15064	N39 W80	50	600	2.0									

MCMATH REGION 15067 CMP DATE 18.2 RETURN OF REGION 15033 AND 15034 ROTATION 2 AND 3

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	12	11	15067	N17 E85	43	600	2.5	19911	N15 E78	50	(B)	3				
77	12	13	15067					19911	N15 E51	49	(AP)	4	M	10	1	AXX
77	12	14	15067					19911	N16 E38	49	(AP)	4	B	10	2	BXO
77	12	16	15067	N17 E21	41	2300	3.0	19913	N15 E25	36	(B)	3	R	30	7	CRO
77	12	17	15067	N17 E08	40	2500	3.0		N15 E20				M	20	3	CRO
77	12	18	15067	N18 W08	41	2500	3.0	19915	N17 W13	47	AP	2				
77	12	19	15067					19915	N15 W27	49	(AP)	3	M	30	4	DSO
77	12		15067						N20 E12				M	10	2	BXO
77	12	22	15067	N18 W60	41	2000	2.5	19917	N15 W53	36	(B)	2	R	20	3	CRO
77	12	23	15067	N18 W72	42	1600	2.5		N16 W57				M	10	2	BXX

MCMATH REGION 15073 CMP DATE 19.4

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	12	22	15073	S12 W45	26	300	2.5									
77	12	23	15073	S12 W56	26	300	2.0									
77	12	25	15073	S12 W80	25	300	1.5									

MCMATH REGION 15068 CMP DATE 19.7

				CALCIUM PLAGE DATA				SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	12	16	15068	S12 E41	21	300	3.0	19914	S12 E39	22	(B)	4	R	10	2	BXO
77	12	17	15068	S12 E26	20	400	2.5		S12 E34				M	20	4	BXO
77	12	18	15068	S12 E12	21	400	1.5		S12 E18				M	10	1	AXX

REGIONS OF SOLAR ACTIVITY

DECEMBER 1977

MCMATH REGION 15072 CMP DATE 20.6

CALCIUM PLAGE DATA								SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	12	18	15072	S30 E24	9	100	1.5									

MCMATH REGION 15074 CMP DATE 21.6

CALCIUM PLAGE DATA								SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	12	22	15074	S28 W16	357	200	2.5									
77	12	23	15074	S28 W26	356	400	3.0		S27 W18				H	10	2	BXX
77	12	24	15074					19918	S28 W42	357	X	3	H	20	7	BXO
77	12	25	15074	S28 W52	357	800	3.5		S27 W44				H	110	14	DSI
77	12	26	15074	S28 W66	358	1200	3.5		S27 W56				H	170	17	DAI
77	12	27	15074	S28 W79	357	1200	3.5									

MCMATH REGION 15070 CMP DATE 24.3

CALCIUM PLAGE DATA								SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	12	17	15070	N23 E87	322	700	2.5									
77	12	18	15070	N23 E76	318	1600	3.5	19916	N23 E69	326	AP	4	H	200	1	HAX
77	12	19	15070					19916	N22 E55	328	(BP)	5	H	150	4	CAO
77	12	20	15070					19916	N22 E41	328	BP	5	B	80	2	HSX
77	12	22	15070	N23 E20	321	1600	2.5	19916	N23 E15	328	(AP)	5	B	190	13	CHO
77	12	23	15070	N23 E09	321	2000	3.0		N22 E13				H	120	6	CSO
77	12	24	15070					19916	N23 W12	327	AP	5	H	130	5	CSO
77	12	25	15070	N23 W20	325	1800	3.5		N22 W14				H	140	5	CSO
77	12	26	15070	N23 W32	324	1400	3.0		N22 W28				H	140	3	HSX
77	12	27	15070	N23 W45	323	1200	3.0		N22 W51				B	60	1	HSO
77	12	28	15070	N23 W57	321	1000	2.5		N22 W63				B	110	1	HSX

MCMATH REGION 15077 CMP DATE 26.6

CALCIUM PLAGE DATA								SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	12	25	15077	S27 E13	292	200	2.0									
77	12	26	15077	S27 W01	293	200	2.0		S27 W06				H	10	1	AXX
77	12	27	15077	S27 W13	291	200	1.5									

MCMATH REGION 15084 CMP DATE 27.8

CALCIUM PLAGE DATA								SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	12	31	15084	S22 W51	275	200	1.5									
78	1	02	15084	S23 W80		200	2.0									

MCMATH REGION 15076 CMP DATE 28.0

CALCIUM PLAGE DATA								SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	12	23	15076	N30 E58	272	200	1.0									

MCMATH REGION 15075 CMP DATE 29.5 RETURN OF REGION 15044 ROTATION 3

CALCIUM PLAGE DATA								SUNSPOT DATA								
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	12	22	15075	N17 E85	256	900	2.0									
77	12	23	15075	N17 E78	252	2000	3.5									
77	12	24	15075					19919	N21 E65	250	X	2	H	50	2	CSO
77	12		15075					19920	N17 E60	255	X	2				
77	12	25	15075	N17 E50	255	2500	3.0		N20 E58				H	100	4	DAO
77	12	26	15075	N17 E37	255	2700	2.5		N20 E46				H	60	5	CSO
77	12		15075						N21 E33				H	10	2	HRX
77	12	27	15075	N17 E24	254	2400	3.0		N18 E23				B	10	2	HRO
77	12	28	15075	N17 E11	253	2000	3.0		N19 E10				B	20	1	AXX
77	12	31	15075	N19 W30	254	2500	2.5									

(Cont'd)

REGIONS OF SOLAR ACTIVITY

DECEMBER 1977

MCMATH REGION 15075 (CONT) CMP DATE 29.5 RETURN OF REGION 15044 ROTATION 3

				CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	1	01	15075						N19 W43				B	20	6	C
78	1	02	15075	N19 W57		2000	2.5	19921	N23 W55		(B)	3	B	10	2	A
78	1	03	15075	N19 W69		1500	2.0		N21 W68				B	30	3	B
78	1	04	15075	N20 W82		1000	2.0		N22 W84				B	20	3	B

MCMATH REGION 15080 CMP DATE 30.6

				CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	12	26	15080	N22 E56	236	400	3.0		N21 E49				H	50	5	DRO
77	12	27	15080	N21 E42	236	600	3.0		N20 E36				B	40	2	DSO
77	12	28	15080	N21 E28	236	800	3.0		N21 E24				B	90	4	DSO
77	12	31	15080	N20 W14	238	2000	3.0		N19 W20				H	30	9	CPO
78	1	01	15080						N21 W29				B	220	27	D
78	1	02	15080	N20 W39		2500	3.0	19922	N22 W41		(B)	4	B	410	34	D
78	1	03	15080	N21 W51		2500	3.0		N20 W55				B	400	20	E
78	1	04	15080	N20 W64		1900	3.0		N21 W63				B	700	31	E
78	1	05	15080						N19 W79				B	462	10	D

MCMATH REGION 15085 CMP DATE 30.9

				CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	12	31	15085	N11 W11	235	200	1.5									

MCMATH REGION 15094 CMP DATE 31.0

				CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
78	1	03	15094	S25 W47		300	2.0									
78	1	04	15094	S25 W60		200	1.0									

MCMATH REGION 15078 CMP DATE 31.1 RETURN OF REGION 15029 ROTATION 2

				CALCIUM PLAGE DATA					SUNSPOT DATA							
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS
77	12	25	15078	S16 E74	231	300	1.0									
77	12	26	15078	S16 E60	232	400	1.0									

DAILY CALCIUM PLAGE INDEX

DECEMBER 1977

YR	MO	DAY	INDEX	YR	MO	DAY	INDEX	YR	MO	DAY	INDEX
77	12	1	*	77	12	11	18.9	77	12	21	*
77	12	2	19.0	77	12	12	*	77	12	22	7.0
77	12	3	21.1	77	12	13	*	77	12	23	9.2
77	12	4	14.7	77	12	14	*	77	12	24	*
77	12	5	*	77	12	15	*	77	12	25	11.9
77	12	6	*	77	12	16	17.9	77	12	26	11.1
77	12	7	22.5	77	12	17	15.6	77	12	27	11.7
77	12	8	*	77	12	18	15.0	77	12	28	11.7
77	12	9	19.8	77	12	19	*	77	12	29	*
77	12	10	19.5	77	12	20	*	77	12	30	*
								77	12	31	31.3

* NO OBSERVATIONS

Note: No calcium spectroheliograms were secured at the McMath-Hulbert Observatory on December 1, 5, 6, 8, 12, 13, 14, 15, 19, 20, 21, 24, 29 and 30, 1977.
No sunspot observations were made at Mt. Wilson on December 9, 12, 15, 17, 21, 23, 25, 26, 27, 28, 29, 30 and 31, 1977.

ERRATA: SGD No. 400, Part I, p. 94, Region 14979: "Return of Region 14942" should read "Return of Regions 14942 and 14943".

SUDDEN IONOSPHERIC DISTURBANCES

DECEMBER 1977

DAY	UNIVERSAL TIME START	END	MAX	IMP	WIDE SPREAD INDEX	NUMBER OF STATION REPORTS BY TIME SWF	SCNA	SEA	SPA	LF-SPA	SES	SFD	KNOWN FLARE	McMATH REGION
01	0627	0701	0632	1-	1				1				0622	X-RAY
02	1707	1815	1715	1	1	1							*	
05	2314	2355	2320	1-	3			1	1				2322E	15056
06	0037	0102	0046	1-	1				1				0037	X-RAY
06	0203	0234	0208	1-	1				1				0206	15056
06	1936	2057	1940	1+	5	2		2	2	1	7	2	1936E	15049
06	2000	2015	2004	1-	1	1							*	
07	0244	0332	0258	1-	1				1				0241	15056
07	0456	0527D	0504	1-	1				1				0452	X-RAY
07	0523E	0604	0530	1-	1				1				0522	X-RAY
07	0617	0754	0635	1+	1				1				0607	X-RAY
07	0829	0900	0836	1-	1				1				0826	X-RAY
07	0951	1034D	1005	1-	3				2				0948	X-RAY
07	1040	1140	1045	1	1				2				1040	15044
07	1139	1224	1146	1-	3			1	2				1135	X-RAY
07	1535	1700	1600	1-	5			3	1		8		1540E	15056
07	1754	1826	1758	1-	5			2	2	1	8		1757E	15056
07	1947	2016	1948	1-	5			2	1	1	6		1940E	15056
08	0148	0234	0155	1-	1				1				0155	15056
09	0656	0807	0703	1+	1				1				0653	X-RAY
09	1022	1040	1025	1-	1			1					1021	X-RAY
09	1357	1430	1401	1-	1				1		1		1355	X-RAY
09	1942	1957	1943	1-	1				1	1			1939	15056
09	2029	2053	2033	1-	1				1				2030	X-RAY
09	2140	2159	2144	1-	1				1				2136	X-RAY
09	2318	0024	2342	1-	1				1				2320	X-RAY
10	0307	0456	0320	2	5			1	1		1		0307	15056
10	0702	0754D	0715	1-	1				1				0700	X-RAY
10	0754E	0900	0805	1+	1			1	1				0753	X-RAY
10	1035	1105	1040	1-	1			1	1				1028	X-RAY
10	1709	1740	1711	1-	3			2			2		1712E	15056
11	0030	0156	0044	1	3				2		1		0035E	15056
11	0945	1030	0952	1-	5			1	2		2		0948	15056
11	1914	1959	1920	1-	3			2	1				1906	X-RAY
11	2158	0022	2212	2-	5	1		4	2		4		2154E	15056
12	0220	0358	0235	2-	5	2		1	1		1		0222E	15056
12	0444	0603	0508	1-	1				1				*	
12	1100	1110	1103	1-	1			1					1056	X-RAY
12	1126	1145	1130	1	5	1		2		2	1		1122	15056
12	1155	1230	1207	1-	1						1		1155E	15056
12	1424	1515	1433	1-	1				1		1		1420	X-RAY
12	1615	1555	1-	1					1		1		1542	X-RAY
13	0032	0135D	0038	1-	5			1	1		1		0033	15056
13	0139	0200	0146	1-	1				1				0137	15056
24	1304	1400	1309	1-	1				1		1		1300	X-RAY
24	1613	1640	1616	1-	1			1					1606	X-RAY
24	2019	2034	2023	1-	3			3	1		4		2020E	15074
25	2141	2205	2146	1-	5	1		2	2				2143	15074
25	2250	2354	2305	1-	3			1	2				2247	X-RAY
26	0156	0404	0221	2+	3	1		1	1		1		0150	15074
26	0451	0535	0457	1-	1				1				0450	X-RAY
26	0628	0718	0636	1-	1				1				0627	15074
26	1203	1220	1208	1-	3				2		1		1205E	15074
26	1222	1300	1230	1-	3			1	2		1		1221E	15081
26	1845	2015	1910	1-	3	1		3			2		1844	X-RAY
26	1858	1951	1906	1	3				1	1	1		*	
26	2326	0050	2334	2	5	1		2	2				2323	X-RAY
27	0155	0240	0216	1-	1				1				0152	X-RAY
27	0436E	0542	0450	1-	1				1				0435	X-RAY
27	1045	1230	1158	1	5			3	3		1		1039	X-RAY
28	0221	0314	0230	1-	1				1				0217	X-RAY
28	0857	0925	0910	2	3				2				0856	15081
28	2146	2304	2156	1	5			1	2		2		2142	X-RAY

SUDDEN IONOSPHERIC DISTURBANCES

DECEMBER 1977

DAY	UNIVERSAL TIME START	END	MAX	IMP	WIDE SPREAD INDEX	NUMBER OF STATION REPORTS BY TYPE SWF	SCNA	SEA	SPA	LF-SPA	SES	SFD	KNOWN FLARE	McMATH REGION
29	0035	0244	0054	1	3	1			1		1		0028	X-RAY
29	0623E	0806D	0646	1-	1				1				0636	15083
29	0808E	0847	0811	1-	1				1				0812E	15083
29	0859	0944	0910	2	5				2		1		0904	15083
29	1052	1118	1100	1-	1			1	1				1054	15081
29	1140	1300	1145	1+	5			4	4		2		1138	15081
29	1426	1500	1430	1-	1						1		1424	15081
30	0406	0604	0413	2	3	1					1		0406	15083
30	1020	1052	1026	1-	5			2	3				1020	15083
30	1254	1500	1303	1-	5			2	4		1		1255E	15083
31	0906	0933	0911	1-	1			1	1				0907	15083
31	1920	2000	1930	1-	3			3			2		1915	X-RAY
31	2151	2153	2152	1-	1							1	2149	X-RAY
31	2328	0102	2343	1+	5	1		1	1		1	1	2335E	15083

PERIODS OF NO OBSERVATIONS:

DATE	TIME (UT) and STATION
01-22	0000-2400 A26
04	0300-0622 UM (13 kHz)
06	0349-0450 UM (13 kHz), 1005-1333 UM (16 kHz)
07	2110-2337 UM (13 kHz), 2110-2337 UM (16 kHz)
08	0255-0436 UM (13 kHz), 0255-0436 UM (16 kHz)
12-31	0000-2400 A37
12	0000-2400 A19
13	1010-1350 UM (16 kHz)
15-18	0000-2400 TN
17-18	1200-2112 UM (16 kHz)
17	0215-0319 UM (13 kHz), 2000-2105 UM (13 kHz)
18	2205-2304 UM (16 kHz)
19	1656-1736 TM
20	0000-2400 TN
21	1527-1539 TM
27	0417-1600 MC, 1004-1332 UM (16 kHz)
28	2120-2241 UM (13 kHz)
30	0735-1115 UM (13 kHz), 0735-1115 UM (16 kHz), 1433-1500 MC
31	1600-1813 MC

STATIONS REPORTING FOR DECEMBER 1977

AAVSO (A1, A19, A21, A28, A30, A31, A34, A35, A37, A40,) (SES) (A1, A26, A31) (SEA) (A31) (SWF)
HAWAII (HA) (SFD)
HERSTMONCEUX (HC) (SEA)
HIRAISO (HI) (SWF)
HOBART (TA) (SEA, SES)
INUBO (IN) (SPA)
KUHLUNGSBORN (KU) (SWF, SEA, SPA)
MAUI (MU) (SFD)
MC MATH (MC) (SWF, SCNA)
PANSKA VES (PU) (SEA, SES)
SAO PAULO (UM) (SES, SPA)
SOFIA (SF) (SEA)
ST CLOUD (SC) (SES)
TABLE MOUNTAIN (TM) (SPA, LF-SPA)
TORINO (TN) (SPA)
UPICE (UI) (SEA)

SID's BY McMATH REGION

DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
REGION																															
15044							1																								
15049						1																									
15056					1	1	4	1	2	2	3	3	2																		
15074																								1	1	3					
15081																										1		1	3		
51083																													3	3	2
X-RAY	1					1	6		5	3	1	3												2	1	3	3	2	1		2
UNKNOWN																															
NO FP		1			1							1														1					

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

DECEMBER 1977

	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
01	0000	0913	MANI							0228.8	0229.2	3	III
	0732	1449	WEIS				0745.2	0745.4	2				IIIG
			WEIS				0748.3	0748.4	2				IIIG
			WEIS				0752.3	0752.9	1				IIIG
			WEIS				0759.5	0807.0	1				IIIG
			WEIS				0818.0	0818.1	1				IIIB
			WEIS				0824.5	0825.0	1				IIIG
			WEIS				0829.2	0829.7	2				IIIG
			WEIS				0848.5	0912.3	3				IIIGG
	0710	1516	DURN	0903.2	0905.0	1	0903.2	0905.0	1				IIIG
			DURN	0909.3	0911.3	3	0909.3	0911.3	3				IIIG
			WEIS				0925.4	0925.8	1				IIIG
			WEIS				0932.2	0923.5	1				IIIG
			WEIS				0936.4	0936.7	1				IIIB
			WEIS				0944.0	0952.8	3				IIIGG
			DURN	0949.8	0952.6	3	0949.8	0952.6	3				IIIG
			WEIS				0959.0	1005.6	3				IIIGG
			DURN	1000.6	1005.1	3	1000.6	1005.1	3				IIIGG
			WEIS				1011.0	1011.1					IIIB
			WEIS				1013.5	1015.0	1				IIIG
			WEIS				1017.3	1017.4	1				IIIG
			WEIS				1100.7	1102.2	1				IIIG
			DURN				1101.5	1101.7	3				IIIG
			WEIS				1115.7	1115.8	1				IIIB
			WEIS				1122.2	1131.2	3				IIIGG
			WEIS				1123.5	1123.6	1				IIIB
	1158	2105	SGMR							1322.9	1331.0	1	IIIG
			DURN				1324.8	1330.6	3				IIIGG
			WEIS				1353.0	1353.6	1				IIIG
			WEIS				1428.3	1430.1	1				IIIG
	1400	2340	HARV				1529		1	1529		1	IIIG
			SGMR							1555.2	1556.1	2	V
			HARV				1555	1556	3	1555	1556	3	IIIG,V
			SGMR							1557.8	1558.0	1	III
			HARV	1558		2	1558		3	1558		3	IIIG
			HARV				1559	1600	3	1559	1600	3	IIIG
			HARV				1603		1				IIIB
			SGMR							1606.9	1607.1	1	III
			HARV				1606	1607	3	1606	1607	3	IIIG
			HARV				1609		3	1609		3	IIIG
			HARV				1654		2	1654		2	IIIG
			HARV				1658		1				IIIB
			HARV				1724	1726	3	1724	1726	3	IIIG
			HARV				1731	1733	3	1731	1733	3	IIIG,V
			SGMR							1744.5	1806.3	1	IIIS
			HARV				1744	1748	3	1744	1748	3	IIIGG,V
			HARV				1757	1758	3				IIIG
			HARV				1802		3	1802		3	IIIG,V
			HARV				1805	1806	3	1805	1806	3	IIIG
			HARV				1811	1814	2	1811	1814	2	IIIG
			HARV				1816	1817	1	1816	1817	1	IIIG
			SGMR							1850.9	1907.4	2	IIIS
			HARV				1851	1858	2	1851	1858	2	IIIGG,V
			HARV	1900	1901	1	1900	1902	3	1900	1902	3	IIIGG,V
			HARV				1907		3	1907		3	IIIB,V
			SGMR							2005.9	2007.2	1	III
			HARV				2006	2007	3	2007		3	IIIG,V
			HARV				2012	2017	3	2013	2015	3	IIIGG
			HARV				2019	2023	3	2019	2022	3	IIIGG
			HARV				2115		3	2115		3	IIIB
			HARV				2118	2119	3	2118	2119	3	IIIG
			HARV				2121		1	2121		1	IIIB
			HARV				2232	2237	2	2232	2237	2	IIIGG
02	0735	1024	WEIS				0805.0	0805.7	2				IIIG
			WEIS				0949.6	0950.1	2				IIIG
	1041	1449	WEIS				1044.1	1044.7	2				IIIG
			WEIS				1109.4	1111.1	2				IIIG
	0712	1514	DURN	1109.5	1109.5		1109.5	1109.5					IIIW
			DURN				1122.3	1122.3	1				III

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

DECEMBER 1977

	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
02			WEIS				1130.9	1132.3	3				IIIG
			DURN				1131.1	1131.2	3				III
	1159	2105	SGMR										
			WEIS				1218.0	1218.2	1				IIIB
			WEIS				1237.2	1238.7	3				IIIG
	1400	2340	HARV				1705		2				IIIG
			HARV				1716		3	1716		3	IIIB
			HARV				1738		2	1738		2	IIIB
			HARV				1839		2	1839		2	IIIB
			HARV				1853		2	1853		2	IIIB
			HARV				1914		1	1914		1	IIIB
			HARV				2011		1	2011		1	IIIB
03	0713	1513	DURN										
	1200	2105	SGMR										
	0918	1428	WEIS				1334.2	1334.6	1				IIIG
	1400	2340	HARV										
04	0741	1448	WEIS				1022.3	1022.8	2				IIIG
			WEIS				1039.5	1039.7	1				IIIB
			WEIS				1308.3	1308.7	2				IIIG
	1201	2105	SGMR							1330.0	1333.3	2	V
			WEIS				1332.8	1333.2	3				IIIG
	0714	1512	DURN				1332.9	1333.0	2				IIIG
			WEIS				1337.4	1337.7	2				IIIB
			DURN	1457.2	1457.2	2							III
	1400	2340	HARV				1704	1705	1				IIIG
			HARV				2113	2114	2	2113	2114	2	IIIG
05	0715	1511	DURN				0715 E	0728	1				IC,N
	0738	0936	WEIS										
	1400	2340	HARV				1718		1	1718		1	IIIB,W
			HARV				1818		1	1818		1	IIIB
	1202	2105	SGMR							1822.8	1823.6	2	V
			HARV				1823		3	1823		3	IIIG,V
			SGMR							1828.9	1830.0	1	IIIG
			HARV				1828	1831	3	1828	1831	3	IIIGG
			HARV				2308		2	2308		2	IIIG
06	0716	1511	DURN	0716 E	1511 D		0716 E	1511 D	1				IC,N
			DURN	0734.2	0737.7	1	0734.2	0737.7	2				IIIG
	1023	1447	WEIS				1053.9	1054.4	2				IIIB
			WEIS				1056.0	1056.1	1				IIIB
			WEIS				1059.4	1101.3	2				IIIG
			DURN				1100.3	1100.4	3				III
			WEIS				1104.9	1106.9	1				IIIG
			WEIS				1110.7	1111.3	2				IIIG
			WEIS				1114.9	1116.0	2				IIIG
			DURN	1128.6	1132.0	1	1128.6	1132.0	3				IIIG,RS
			WEIS				1130.9	1131.8	2				IIIG
			WEIS				1236.2	1236.4	1				IIIG
	1315	1458	DWIN				1315.9	1316.0	1				IIIG
			DWIN				1318.5	1318.7	1				IIIG
			DWIN				1323.0	1327.0	2				IIIGG
			WEIS				1323.1	1327.1	3				IIIG
	1203	2105	SGMR							1323.3	1324.4	2	V
			SGMR							1324.4	1337.7	1	IIIS
			WEIS				1329.5	1329.9	1				IIIG
			DWIN				1336.2	1343.3	2				IIIGG
			DURN				1336.4	1336.4	2				III
			WEIS				1336.6	1337.5	2				IIIG
			WEIS				1340.9	1341.2	1				IIIG
			DURN	1340.9	1342.5	1	1340.9	1342.5	2				IIIG,RS
			SGMR							1348.0	2105.0	1	CONT
			WEIS				1355.4	1356.5	1				IIIB
			DWIN				1410.8	1425	3				IIIGG
			WEIS				1411.2	1413.4	2				IIIG
			DURN	1411.3	1413.0	3	1411.2	1413.0	3				IIIGG,RS,U
	1400	2340	HARV				1411	1413	2				IIIGG
			WEIS				1417.8	1418.3	1				IIIG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

DECEMBER 1977

	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
06			DURN	1419.1	1423.9	3	1419.1	1423.9	3				IIIGG,RS,U
			WEIS				1419.5	1419.7	1				IIIG
			HARV	1419	1420	1	1420		1				IIIG,W
			HARV				1530	1534	1				IIIGG
			SGMR							1538.8	1539.4	2	V
			HARV				1539		3				IIIG,V
			HARV	1546	1548	2	1546	1548	2	1546	1548	2	IIIGG
			HARV	1550	1552	2	1550	1552	2				IIIG
			HARV	1555	1603	2	1555	1603	2	1558		3	IVP
			HARV				1640	1653	3	1640	1653	3	IIIGG
			HARV				1659		1				IIIB
			HARV				1719		3	1719		3	IIIP,V
			HARV				1737	1738	3	1737	1738	3	IIIG
			HARV				1831	1832	3	1831	1832	3	IIIG
			HARV				1847	1850	2	1847	1850	2	IIIG
			HARV	1932	1935	2	1934	1935	2	1934	1936	3	IIIGG,V,U
			SGMR							1934.8	1936.2	2	IV
			HARV				1936	1952	2	1944	1952	1	II
			HARV	1938		1	1938	1939	1	1939		1	IIIG
			HARV				2114		2	2114		2	IIIB
07	0741	1445	WEIS				0903.7	0904.9	2				IIIG
			WEIS				0907.4	0907.7	2				IIIG
	0716	1511	DURN	0910.5	0910.7	2	0910.5	0910.7	1				IIIG
			WEIS				0910.8	0912.6	1				IIIG
			WEIS				0913.7	0914.0	2				IIIG
			WEIS				0916.3	0916.8	2				IIIG
			WEIS				0921.4	0922.2	2				IIIG
			WEIS				0943.5	0943.8	1				IIIG
			WEIS				0945.9	0947.0	2				IIIG
			DURN	0959.6	0959.6								IIIW
			WEIS				1015.0	1015.1	1				IIIB
			WEIS				1050.3	1051.8	2				IIIG
			WEIS				1102.8	1103.2	2				IIIG
			WEIS				1128.9	1129.1	1				IIIB
			WEIS				1136.2	1136.5	1				IIIG
			DURN	1139.2	1139.3	2							IIIG
			WEIS				1141.4	1141.6	1				IIIB
			WEIS				1146.5	1147.0	3				IIIG
			WEIS				1148.5	1148.6	2				IIIB
			WEIS				1157.4	1158.0	2				IIIB
			WEIS				1221.7	1225.4	2				IIIG
	1204	2105	SGMR							1224.3	1225.0	1	V
			WEIS				1310.5	1311.5	2				IIIG
			SGMR							1348.6	1359.1	2	V
			WEIS				1353.4	1354.2	2				IIIG
			WEIS				1408.7	1408.9	1				IIIB
			WEIS				1410.9	1411.1	1				IIIB
			WEIS				1421.8	1422.0	2				IIIG
			SGMR							1422.9	1427.0	1	IIIS
			DURN				1424.7	1424.7	2				III
			WEIS				1425.3	1426.7	2				IIIG
			WEIS				1444.2	1444.4	2				IIIB
	1400	2340	HARV	1549		2							IIIG
			HARV				1554		2	1554		2	IIIG
			HARV	1556	1600	1							IIIGG
			HARV				1607		2	1607		2	IIIB
			HARV	1639	1640	1	1640		1				IIIG
			HARV				1650	1653	2	1650	1653	2	IIIG
			HARV				1659	1700	2	1659	1700	2	IIIG
			HARV				1715	1716	3	1715	1716	3	IIIG
			SGMR							1759.6	1800.1	1	V
			HARV				1800		3	1800		3	IIIG,V
			HARV				1833		1				IIIB
			HARV	1835		1	1835		1				IIIP
			HARV				1913	1915	3	1913	1915	3	IIIG,V
			HARV	1926		1							IIIG
			HARV	1939		1	1939		1				IIIG
			HARV	1947		3	1947		2				IIIG,U
			HARV	1950	1951	1	1950	1951	1				IIIG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

DECEMBER 1977

	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
07			HARV				1959		1				IIIG
			HARV				2031		2	2031		2	IIIG
			HARV				2118		3	2118		3	IIIB,V
			HARV				2140		2	2140		2	IIIB
			HARV				2146		3	2146		3	IIIB
			HARV				2238		1	2238		1	IIIB
			HARV	2252		1							IIIG
			HARV	2330		1	2330		1				IIIG
08	0717	1511	DURN	0739.1	0739.3	3	0739.1	0739.3	3				IIIG
	0742	1446	WEIS				0817.9	0818.1	1				IIIB
			WEIS				0832.9	0833.2	2				IIIB
			WEIS				0857.8	0858.1	2				IIIG
			WEIS				0916.6	0917.4	2				IIIG
			WEIS				0921.9	0922.2	1				IIIB
			WEIS				0941.9	0943.0	3				IIIG
			WEIS				0947.1	0949.7	2				IIIG
			WEIS				1024.5	1024.6	1				IIIB
			WEIS				1027.4	1028.1	1				IIIG
			WEIS				1032.8	1033.1	1				IIIG
			WEIS				1037.8	1040.8	3				IIIG
			DURN				1047.6	1047.7	2				IIIG
			WEIS				1105.0	1108.8	1				IIIG
			WEIS				1119.8	1125.4	1				IIIG
			WEIS				1244.3	1245.4	2				IIIG
			WEIS				1252.4	1253.7	2				IIIG
	1205	2105	SGMR							1253.0	1254.0	1	IIIG
			WEIS				1256.5	1259.0	3				IIIG
			SGMR							1258.8	1259.0	2	V
			SGMR							1319.2	1319.8	1	IIIG
			WEIS				1319.2	1319.4	2				IIIB
			WEIS				1331.7	1337.2	2				IIIG
			WEIS				1342.9	1343.1	1				IIIB
			WEIS				1348.8	1350.9	2				IIIG
			SGMR							1348.8	1445.7	2	IIIS
			WEIS				1354.0	1354.6	3				IIIB
			WEIS				1411.4	1411.7	2				IIIB
			WEIS				1428.1	1429.4	1				IIIG
			WEIS				1431.2	1431.8	1				IIIB
			WEIS				1443.4	1443.9	2				IIIG
	1400	2340	HARV				1723		1				IIIB
			HARV				1740		2	1740		2	IIIG
			HARV				1807	1808	3	1807	1808	3	IIIG,V
			HARV				1825		1	1825		1	IIIG
			HARV				1830		1				IIIB,W
			HARV				1836	1843	3	1836	1843	3	IIIGG,V
			SGMR							1839.3	1843.0	2	V
			HARV				1857	1858	3	1857	1858	3	IIIG
			HARV				1904	1905	1	1904	1905	1	IIIG
			HARV				1913	1918	3	1913	1918	3	IIIGG
			SGMR							1914.4	1915.2	1	V
			SGMR							1915.4	1918.3	1	IIIG
			HARV				1939		1	1939		1	IIIB
			HARV				2053		3	2053		3	IIIB,V
	2205	2400	MANI							2246.0	2246.1	1	III
09	0743	0838	WEIS										
	0717	1511	DURN	0806.0	0806.4	3							IIIG
	0849	1446	WEIS				0851.2	0852.9	2				IIIG
			DURN	0853.0	0853.0	2							IIIG
	0856	1353	DWIN				0856	1353	1				IS
			WEIS				0918.2	0922.3	1				IIIG
			DWIN				0921.0	0921.2					IIIG
			DURN	0935	1240	1	0935	1240	1				IC,DC,N
			WEIS				1000.5	1000.6	1				IIIG
			WEIS				1011.3	1013.0	3				IIIG
			DWIN				1011.5	1012.5	3				IIIG
			DURN	1011.6	1011.8	3	1011.6	1012.0	3				IIIG
			DWIN				1013.9	1014.2	2				IIIG
			WEIS				1020.8	1023.1	3				IIIG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS
DECEMBER 1977

	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
09			DURN				1022.6	1022.6	2				III
			DURN	1025.2	1026.5	3							IIIGG
			WEIS				1028.7	1029.8	1				IIIG
			WEIS				1051.9	1056.2	1				IIIG
			WEIS				1116.8	1117.0	1				IIIB
			WEIS				1130.9	1131.3	1				IIIG
			WEIS				1153.4	1153.5	1				IIIB
			WEIS				1210.2	1214.0	3				IIIG,V
			DWIN				1210.2	1211.0	2				IIIG
	1206	2105	SGMR							1210.6	1212.5	1	V
			WEIS				1310.1	1312.1	1				IIIG
			WEIS				1343.0	1349.7	3				IIIG
			WEIS				1344.8	1344.4	1				IIIB
			DWIN				1349.0	1349.9	3				IIIG
			WEIS				1358.5	1400.8	3				IIIG
			DURN	1358.6	1359.8	3	1359.0	1359.9	3				IIIGG
			SGMR							1359.7	1400.7	2	V
			WEIS				1407.8	1408.1	1				IIIG
			WEIS				1418.9	1419.3	2				IIIG
			WEIS				1428.4	1430.6	2				IIIG
			SGMR							1430.1	2105.0	1	IIIS
	1601	2340	HARV				1623		1	1623		1	IIIB,W
			HARV				1707	1716	2	1707	1716	2	IIIN
			HARV				1723		3	1723		3	IIIB,V
			HARV				1736		2	1736		2	IIIB
			HARV				1743		2	1743		2	IIIB
			HARV				1747		3	1747		3	IIIB
			HARV				1845		1				IIIG,W
			HARV				1851	1852	2	1851	1852	2	IIIG
			HARV				1953	1954	2	1953	1954	2	IIIG
10	0000	0913	MANI							0214.8	0215.1	2	III
			MANI							0222.0	0225.0	1	II
			MANI							0234.5	0235.0	1	III
			MANI							0418.1	0436.5	1	CCNT
	0720	1511	DURN	0720 E	1020	3	0720 E	1020	3				IC,DC,N
			DURN	0726.1	0726.1	3	0726.1	0726.3	3				III
	0744	1446	WEIS				0748.0	1424.0	3				IS,C
			DURN	0756.5	0756.7	1							OCIM
			DURN	0757.1	0757.6	3	0757.1	0757.6	3				IIIG
			DURN	0802.3	0802.5	2	0802.3	0802.5	2				IIIG
			DURN	0802.3	0803.1	2							OCIM
			DURN	0816.7	0818.4	1							IIIGG
			WEIS				0855.7	0856.8	2				IIIG
			DURN	1020	1511 D	1	1020	1511 D	1				IC,N
			WEIS				1050.2	1050.5	2				IIIG
			WEIS				1142.5	1142.7	2				IIIB
			WEIS				1211.3	1211.5	1				IIIG
			WEIS				1322.2	1322.3	2				IIIB
			WEIS				1406.6	1406.7	1				IIIG
			DURN				1452.6	1455.5	3				IIIGG
	1207	2105	SGMR							1453.0	1453.8	2	III
	1401	2340	HARV				1453	1455	2	1453		2	IIIG,I
			SGMR							1517.2	1517.7	1	III
			HARV				1517		1	1517		1	IIIG
			HARV				1649		3	1649		3	IIIG,V
			HARV				1804	1807	2	1804	1807	2	IIIG
			HARV				1856		3	1856		3	IIIB
			SGMR							1938.7	1939.3	1	V
			HARV				1955		1	1955		1	IIIG
			HARV				2057	2058	2	2057	2058	2	IIIG
			HARV				2112		1				IIIB
	2141	2400	MANI										
			HARV				2153		2				IIIG
11	0000	0915	MANI										
	0722	0804	DURN	0722 E	0804 D	3	0722 E	0804 D	3				IC,DC,N
			DURN	0749.3	0749.3	2							III
	0746	1436	WEIS				0816.3	0818.6	1				IIIG
			WEIS				0906.7	0906.8	1				IIIB

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

DECEMBER 1977

	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
11			WEIS				0951.0	0951.6	2				IIIG
			WEIS				1053.8	1054.4	1				IIIG
			WEIS				1106.0	1203.0	2				IS
			WEIS				1124.5	1124.6	2				IIIB
	1208	2105	SGMR										
	1402	2340	HARV				1409	2258	1				IN,W
			HARV				1715		2	1715		2	IIIB
			HARV				1728		1	1728		1	IIIB
			HARV				1733		3	1733		3	IIIB
			HARV				1816		1	1816		1	IIIB
			HARV				1935	1936	1	1935	1936	1	IIIG
	2142	2400	MANI							2225.2	2225.8	1	III
12	0000	0910	MANI							0210.4	0212.0	1	III
			MANI							0228.2	0229.8	1	III
			MANI							0509.5	0509.7	1	III
			MANI							0549.4	0549.8	1	III
			MANI							0649.1	0649.3	2	III
			MANI							0649.8	0650.0	2	III
	0723	1512	DURN	0723 E	1512 O	1	0723 E	1512 O	1				IC,DC,N
			WEIS				0754.0	1423.0	2				IS,DC
	0750	1445	WEIS				0807.0	1413.0	1				IIIN
			WEIS				1007.5	1007.8	2				IIIG
	1209	2105	SGMR										
	1329	1504	DWIN				1329	1504	1				IS
	1402	2340	HARV				1820		1	1820		1	IIIG
			HARV				1836	1839	1	1836	1839	1	IIIG
			HARV				1913		1	1913		1	IIIB
	2227	2400	MANI										
13	0000	0918	MANI										
	0724	1512	DURN	0932.7	0932.7	3	0932.7	0932.7	3				III
	0748	1445	WEIS				1111.3	1111.7	2				IIIG
	1210	2105	SGMR										
			DURN	1254.9	1255.0	1	1254.9	1255.0	1				IIIG
	1406	2340	HARV				1644		1	1644		1	IIIB
			HARV				1757		1				IIIB
			HARV				1803	1805	1				IIIG
			HARV				1814	1815	1	1814	1815	1	IIIG
			HARV				1835		3	1835		3	IIIB
			HARV				1857	1931	1	1857	1931	1	IIIN
			HARV				2038		1				IIIB
	2222	2400	MANI										
14	0000	0917	MANI							0051.0	0053.0	1	II
			MANI							0118.5	0119.7	1	II
			MANI							0247.6	0250.2	1	II
			MANI							0315.0	0318.0	1	II
			MANI							0344.5	0347.2	1	II
	0725	1512	DURN										
	0725	1512	DURN										
	0748	1421	WEIS										
	1211	2105	SGMR										
	1403	2340	HARV										
	2159	2400	MANI							2314.4	2315.8	1	II
			MANI							2340.3	2342.7	1	II
15	0000	0916	MANI							0205.0	0207.7	1	II
			MANI							0210.8	0213.0	1	II
	0726	1512	DURN										
	0844	1445	WEIS										
	1211	2106	SGMR										
	1420	2340	HARV				1719		1	1719		1	IIIB
	2143	2400	MANI										
16	0000	0912	MANI							0010.0	0010.4	1	III
			MANI							0011.5	0014.2	1	II
			MANI							0200.7	0201.1	1	III
	0727	1512	DURN										
	0750	1445	WEIS										

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

DECEMBER 1977

	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
16	1212	2106	SGMR										
	1415	2340	HARV										
	2237	2400	MANI										
17	0000	0825	MANI							0128.4	0130.9	1	II
			MANI							0155.3	0157.8	1	II
			MANI							0351.0	0354.7	1	II
	0728	0820	DURN										
	1213	2106	SGMR										
	1214	1446	WEIS										
	1415	2340	HARV										
18	0751	0821	WEIS										
	0831	1446	WEIS										
	1037	1512	DURN										
	1213	2107	SGMR										
	1415	2340	HARV				1802		1	1802		1	IIIB
19	0753	1446	WEIS				0824.3	0824.5	1				IIIG
	0729	1512	DURN				0902.8	0902.8	2				III
			DURN	0905	0925		0905	0925					IC,W,N
			WEIS				0912.8	0913.0	2				IIIG
			WEIS				1001.2	1002.1	3				IIIG
			WEIS				1025.4	1026.0	1				IIIG
			WEIS				1108.3	1109.0	2				IIIG
	1214	2107	SGMR										
	1415	2340	HARV				1944		2	1944		2	IIIG
20	0730	1512	DURN										
	0753	1446	WEIS				1212.5	1213.8	2				IIIG
	1215	2107	SGMR										
	1415	2340	HARV				1700	1702	2	1702		2	IIIG
21	0753	0806	WEIS										
	0731	1512	DURN	1153.0	1153.4	3	1153.0	1153.4	3				IIIGG
	1215	2108	SGMR										
	1415	2340	HARV				1827	1828	2	1827	1828	2	IIIG
			HARV				2027		2				IIIB
22	5		MANI							0432.4	0432.8	2	III
	0731	1512	DURN	0731 E	1512 D	2	0731 E	1512 D	3				IC,DC,N
	1020	1417	DWIN				1020	1417	1				IC
	1212	1447	WEIS				1244.9	1314.0	1				IS
			WEIS				1410.7	1411.8	2				IIIG
			DURN	1414.7	1415.6	3	1414.7	1415.6	3				IIIGG,RS
			WEIS				1414.8	1415.6	3				IIIG
			DWIN				1414.8	1415.6	3				IIIG
	1215	2109	SGMR							1414.9	1415.7	2	V
			HARV				1415	1424	1				I
	1415	2340	HARV				1415		2				IIIGG
			WEIS				1437.5	1438.7	1				IIIG
			DURN				1506.4	1506.5	2				IIIG
			HARV	1655	1656	1	1653	1700	2	1653	1700	2	IIIGG
			HARV				1830	1834	2	1830	1834	2	IIIGG
			HARV				1842		1	1842		1	IIIG
			HARV				1859		2	1859		2	IIIG
			HARV				1943		1				IIIB
			HARV				2024		1	2024		1	IIIG
			HARV				2052		2	2052		2	IIIG
			HARV				2103	2104	2	2103	2104	2	IIIG
			HARV				2300	2340	1				IN
	4		MANI							2354.3	2355.5	1	II
23	0731	1512	DURN	0731 E	1512 D		0731 E	1512 D					IC,W,N
			DURN	0941.4	0942.3	1	0941.4	0942.3	2				IIIG
	0755	1429	WEIS				1101.8	1102.1	1				IIIG
	1216	2109	SGMR										
			WEIS				1259.3	1259.8	2				IIIG
			DURN	1259.4	1259.6	1	1259.4	1259.6	3				IIIG
			WEIS				1345.5	1345.7	1				IIIB

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

DECEMBER 1977

	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
23			WEIS				1349.0	1349.1	1				IIIB
	1415	2340	HARV				1602	1928	2	1602	1928	2	IIIN
			HARV				2114	2117	2	2114	2117	2	IIIG,U
	2351	2400	MANI										
24	0000	0905	MANI							0327.0	0327.2	1	III
	0731	1051	DURN	0731 E	1051 D	1	0731 E	1051 D	1				IC,DC,N
	0801	1458	WEIS				1001.5	1002.7	3				IIIG
			WEIS				1003.8	1004.7	3				IIIG
			DURN				1003.8	1004.0	2				IIIG
			WEIS				1007.5	1016.8	2				IIIG
			WEIS				1028.8	1029.0	1				IIIG
			WEIS				1038.8	1042.0	1				IIIG
			WEIS				1058.0	1059.0	1				IIIG
			WEIS				1103.0	1417.0	2				IS,DC
	1110	1512	DURN	1110 E	1512 D	1	1110 E	1512 D	1				IC,N
			DURN	1212.2	1214.0	3							OCIM
			WEIS				1213.0	1214.1	3				IIIG
			WEIS				1223.2	1223.5	1				IIIB
			DURN	1301.9	1301.9	1	1301.9	1301.9	1				III
			DURN	1303.0	1305.6	3	1303.0	1305.6	3				IIIGG,RS
			WEIS				1303.1	1306.5	3				III,V
			DURN				1303.7	1305.6	3				OCIM
	1216	2110	SGMR							1304.0	1305.7	2	V
			WEIS				1307.4	1312.0	2				II
			DURN				1404.7	1404.7	2				III
			WEIS				1404.8	1405.5	2				IIIG
			DURN	1405.3	1405.4	3							IIIG
			SGMR							1405.5	1405.8	2	V
			WEIS				1415.3	1415.7	1				IIIG
			WEIS				1419.1	1419.7	2				IIIG
			DURN	1419.1	1419.8	3	1419.1	1419.8	3				OCIM
			DURN				1421.2	1421.2	3				III
			WEIS				1432.9	1433.5	2				IIIG
	1415	2345	HARV				1606		1				I
			HARV				1611	1612	1	1611	1612	1	IIIG
			HARV				1832	1841	1	1832	1841	1	IIIG
			HARV				1843	1847	3	1843	1847	3	IIIGG
			SGMR							1844.9	1845.5	2	IV
			SGMR							1846.4	1854.3	1	IIIG
			HARV				1850		2				IIIB
			HARV				1854	1858	3	1854	1858	3	IIIGG
			SGMR							1916.1	1916.5	1	V
			HARV				2016	2018	3	2016	2018	3	IIIG
			HARV				2300	2336	1				IN
	2234	2400	MANI							2303.2	2303.8	1	II
			MANI							2358.2	2359.4	1	III
25	0000	0909	MANI							0020.5	0021.8	1	II
			MANI							0045.4	0049.5	1	II
			MANI							0111.0	0113.0	1	II
			MANI							0344.2	0346.7	1	II
			MANI							0405.2	0405.6	2	III
			MANI							0408.8	0411.6	1	II
			MANI							0511.0	0513.0	1	II
			MANI							0522.0	0525.0	1	II
			MANI							0549.7	0550.3	1	III
			MANI							0551.8	0551.8	1	III
			MANI							0553.1	0553.2	1	III
	0731	1520	DURN	0731 E	1520 D	2	0731 E	1520 D	2				IC,DC,N
			MANI							0739.2	0739.5	1	III
	0756	1449	WEIS				0832.9	0833.9	3				IIIG
			DURN				0833.4	0833.7	1				IIIG
			WEIS				1109.8	1110.0	1				IIIG
			WEIS				1121.2	1121.5	2				IIIG
			WEIS				1313.4	1313.5	1				IIIB
	1217	2110	SGMR							1313.7	1313.9	1	IIIG
			WEIS				1317.5	1317.6	1				IIIB
			WEIS				1318.6	1318.8	2				IIIB
			WEIS				1349.9	1350.1	2				IIIG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

DECEMBER 1977

	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
25	1415	2345	HARV				2017		1	2017		1	IIIB
			HARV				2046		3	2046		3	IIIB
			HARV				2202		1	2202		1	IIIB
	2155	2400	MANI							2300.7	2301.6	2	III
			HARV				2301		3	2301		3	IIIG
26	0000	0918	MANI							0004.0	0004.4	1	III
			MANI							0334.5	0336.2	1	II
			MANI							0401.3	0403.5	1	II
			MANI							0430.5	0430.8	2	III
			MANI							0622.0	0622.5	1	III
	0731	1520	DURN	0731 E	1520 D		0731 E	1520 D					IC,DC,N,W
	0756	1445	WEIS				0807.5	0807.8	2				IIIG
			WEIS				0815.9	0818.5	2				IIIG
			WEIS				0821.2	0822.2	2				IIIG
			DURN				0821.4	0822.2	2				IIIG
			WEIS				0834.1	0836.4	1				IIIG
			WEIS				0846.2	0846.4	2				IIIG
			WEIS				0903.3	0904.0	1				IIIG
			WEIS				0910.9	0911.0	1				IIIG
			WEIS				0919.2	0921.3	2				IIIG
			WEIS				0930.1	0933.8	3				IIIG
			WEIS				0937.4	0944.5	3				IIIGG
			DURN				0939.7	0939.8	1				IIIG
			WEIS				0948.4	0949.0	2				IIIG
			DURN	0949.2	0949.3	1							III
			WEIS				0954.5	0955.4	3				IIIG
			WEIS				0957.8	0959.4	3				IIIG
			WEIS				1028.5	1029.1	3				IIIG
			WEIS				1032.8	1033.0	2				IIIG
			DURN	1039.0	1039.2	3	1039.0	1039.2	3				IIIG,RS
			WEIS				1053.9	1055.0	1				IIIG
			WEIS				1100.9	1101.3	2				IIIG
			WEIS				1120.5	1135.7	3				IIIGG
			WEIS				1141.5	1141.9	2				IIIG
			WEIS				1148.2	1148.7	1				IIIG
			WEIS				1150.0	1150.7	1				IIIG
			WEIS				1154.5	1154.8	1				IIIG
			WEIS				1158.4	1201.1	1				IIIG
			WEIS				1203.2	1205.8	3				IIIGG
			DURN	1203.2	1203.8	3	1203.2	1203.8	3				IIIG
			WEIS				1206.5	1219.0	3				II
			WEIS				1210.4	1211.5	2				IIIGG
			WEIS				1214.2	1214.4	2				IIIG
			WEIS				1222.4	1224.6	3				IIIG
			WEIS				1237.8	1238.2	2				IIIG
			WEIS				1240.5	1240.6	1				IIIG
			WEIS				1242.8	1242.9	1				IIIB
			WEIS				1245.9	1246.0	1				IIIB
			WEIS				1252.4	1257.6	3				IIIGG
			DURN				1252.7	1257.7	3				III
			WEIS				1311.3	1315.5	3				IIIGG
	1218	2110	SGMR							1312.7	2112.0	1	IIIS
			WEIS				1317.5	1318.4	3				IIIG
			DURN				1317.7	1317.8	3				IIIG
			WEIS				1324.5	1324.8	1				IIIG
			WEIS				1326.8	1327.0	1				IIIB
			WEIS				1333.2	1337.1	3				IIIGG
			SGMR							1333.5	1336.8	2	V
			WEIS				1344.5	1344.6	1				IIIB
			WEIS				1347.2	1348.3	2				IIIG
			WEIS				1352.3	1352.8	2				IIIG
			WEIS				1428.8	1429.1	2				IIIG
			WEIS				1433.0	1434.2	3				IIIG
	1415	2345	HARV				1433	1436	2	1433	1436	2	IIIG
			WEIS				1435.5	1436.5	2				IIIG
			SGMR							1435.7	1436.5	2	V
			HARV				1544	1550	2	1544	1550	2	IIIG
			HARV				1643	1645	3	1643	1645	3	IIIG
			HARV				1738	1746	3	1738	1746	3	IIIGG

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

DECEMBER 1977

	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
26			HARV				1803		1	1803		1	IIIE
			HARV				1811		2	1811		2	IIIG
			HARV				1819	1825	1	1819	1825	1	IIIG
			HARV				1859	1906	2				IVP
			HARV				1904	1906	3	1904	1906	3	IIIG
			HARV				1943		1				IIIG
			HARV				2010	2011	2	2010	2011	2	IIIG
			HARV				2022		1	2022		1	IIIB
			HARV				2058	2101	3	2058	2101	3	IIIG
			HARV				2139		1	2139		1	IIIB
	2150	2400	MANI							2302.8	2303.0	2	III
			HARV				2303		3	2303		3	IIIG
			MANI							2337.0	2337.6	1	IIIG
			HARV				2337	2338	1	2337	2338	1	IIIGG
27	0000	0924	MANI							0705.6	0706.4	1	III
	0730	1522	DURN	0912.6	0912.7	1	0912.6	0912.7	3				III
			DURN	0929	1152	1	0929	1611 D	1				IC,N
	0824	1450	WEIS				1025.5	1026.7	2				IIIG
			WEIS				1028.7	1029.2	2				IIIG
			WEIS				1031.9	1032.0	1				IIIG
			DURN	1053.6	1152.0	2	1058.0	1152.0	2				DCIM,N
			WEIS				1059.5	1109.0	3				II
			WEIS				1101.0	1150.0	3				IV
			WEIS				1111.4	1118.0					IIIG
	1133	1433	DWIN				1133	1225	2				IV
	1217	2112	SGMR										
			DWIN				1312.5	1313.2	2				IIIG
			WEIS				1441.3	1442.0	2				IIIG
	1415	2345	HARV				1442		1				IIIG,W
			HARV				1706		1	1706		1	IIIB
			HARV				1906		3	1906		3	IIIG
			HARV				2025		3	2025		3	IIIG
			HARV				2048		3	2048		3	IIIG
	2202	2400	MANI										
			HARV				2208		3	2208		3	IIIB
			HARV				2247	2248	1	2247	2248	1	IIIB
			HARV				2253		2	2253		2	IIIG
28	0000	0929	MANI							0354.2	0357.0	1	II
			MANI							0635.4	0635.2	1	III
			MANI							0734.5	0737.0	1	II
	0730	1522	DURN	0752	1522 D		0752	1522 D					IC
			MANI							0759.6	0802.5	1	II
	0758	1032	WEIS				0817.5	0817.7	1				IIIG
			DURN				0822.6	0822.7	1				IIIG
			WEIS				0829.2	0829.8					III,U
			WEIS				0845.7	0845.8	1				IIIB
	1000	1410	DWIN				1000	1410	1				IS
			DWIN				1001.8	1002.4	2				IIIG
			DURN	1120.7	1121.7	1	1120.7	1121.7	1				IIIG
			DWIN				1120.9	1121.6	2				IIIG
			DWIN				1259.8	1300.4	2				IIIG
			DWIN				1306.7	1306.9	2				IIIG
	1218	2112	SGMR							1306.8	1307.0	1	III
			DWIN				1341.1	1341.2	3				IIIG
			DURN	1344.0	1344.2	3	1344.0	1344.2	3				IIIG
			SGMR							1344.2	1344.6	2	V
	1415	2345	HARV				1715	1719	2	1715	1719	2	IIIG
			SGMR							1738.2	1739.0	1	V
			HARV				1738	1739	3	1738	1739	3	IIIG,V
			HARV				1852		1				IIIB
			HARV				1912		3	1912		3	IIIB
	2154	2400	MANI										
			HARV				2218	2220	3	2218	2220	3	IIIG
29	0000	0931	MANI										
	0730	1522	DURN	0730 E	1522 D	1	0730 E	1522 D	1				IC
			DURN	0734.3	0735.3	2							IIIG
			DURN	0737.6	0737.7								IIIG,W

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

DECEMBER 1977

	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
29	1216	2113	SGMR										
	1415	2345	HARV										
30	0000	0927	MANI										
	0730	1255	DURN	0730 E	1255 D	1	0730 E	1255 D	1				IC,N
			DURN	0808.2	0808.3	1	0808.2	0808.3	1				IIIG
			DURN	0834.7	0834.8	2							III,RS
			DURN	1021.6	1023.1	3	1021.6	1022.2	2				IIIGG,RS
	1415	2345	HARV				1701		1	1701		1	IIIB
	1218	2114	SGMR							1904.7	1904.9	1	III
			HARV				1904	1905	3	1904	1905	3	IIIG
	2230	2400	MANI										
31	0000	0920	MANI							0325.2	0326.9	1	II
			MANI							0337.0	0340.2	2	II
			MANI							0349.0	0351.2	1	II
			MANI							0400.0	0403.6	2	II
			MANI							0412.0	0415.2	2	II
	0744	1522	DURN	0744 E	1320		0744 E	1320					IS,C,DC
			DURN	0905.6	0908.3	3	0906.8	0908.3	3				IIIGG,U,RS
	1218	2115	SGMR										
			DURN	1257.3	1257.5	3	1257.0	1257.5	3				IIIGG
			DURN	1358.7	1359.0	3	1358.7	1359.0	3				IIIG
	1415	2345	HARV										
			DURN	1442.6	1442.6	1	1442.6	1442.6	1				III
	2231	2400	MANI										
1			MANI							0231.7	0232.6	3	III
			MANI							0301.6	0302.0	1	III
			MANI							0354.1	0354.9	2	IIIG
			MANI							0408.3	0408.8	1	III
			MANI							0620.4	0631.2	2	IIIG
	2150	2400	MANI							2312.4	2314.3	1	II
2	0000	0913	MANI							0120.0	0121.9	3	CONT
			MANI							0239.8	0240.2	2	III
			MANI							0400.7	0400.8	1	III
			MANI							0411.8	0411.9	1	III
			MANI							0420.2	0420.5	1	III
			MANI							0441.5	0441.8	2	III
	2145	2400	MANI										
3	0000	0913	MANI										
	2210	2400	MANI										
4	0000	0909	MANI										
	2145	2400	MANI										
5	0000	0907	MANI										
	2142	2400	MANI										
6	0000	0912	MANI							0158.1	0158.2	1	III
			MANI							0205.4	0205.6	1	III
			MANI							0348.0	0348.8	1	IIIG
	2120	2400	MANI										
7	0000	0912	MANI							0338.0	0340.0	3	IIIG
			MANI							0644.0	0644.5	1	III
	2205	2400	MANI										
8	0000	0914	MANI							0024.7	0025.3	3	IIIG
			MANI							0037.3	0037.8	3	IIIG
			MANI							0138.6	0138.8	2	III
			MANI							0206.2	0206.5	3	III
			MANI							0207.6	0207.9	2	III
			MANI							0250.3	0250.5	3	III
			MANI							0253.0	0253.3	2	III
			MANI							0258.0	0303.0	3	CONT
			MANI							0648.7	0649.0	2	III
			MANI							2255.0	2256.8	1	II

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS
DECEMBER 1977

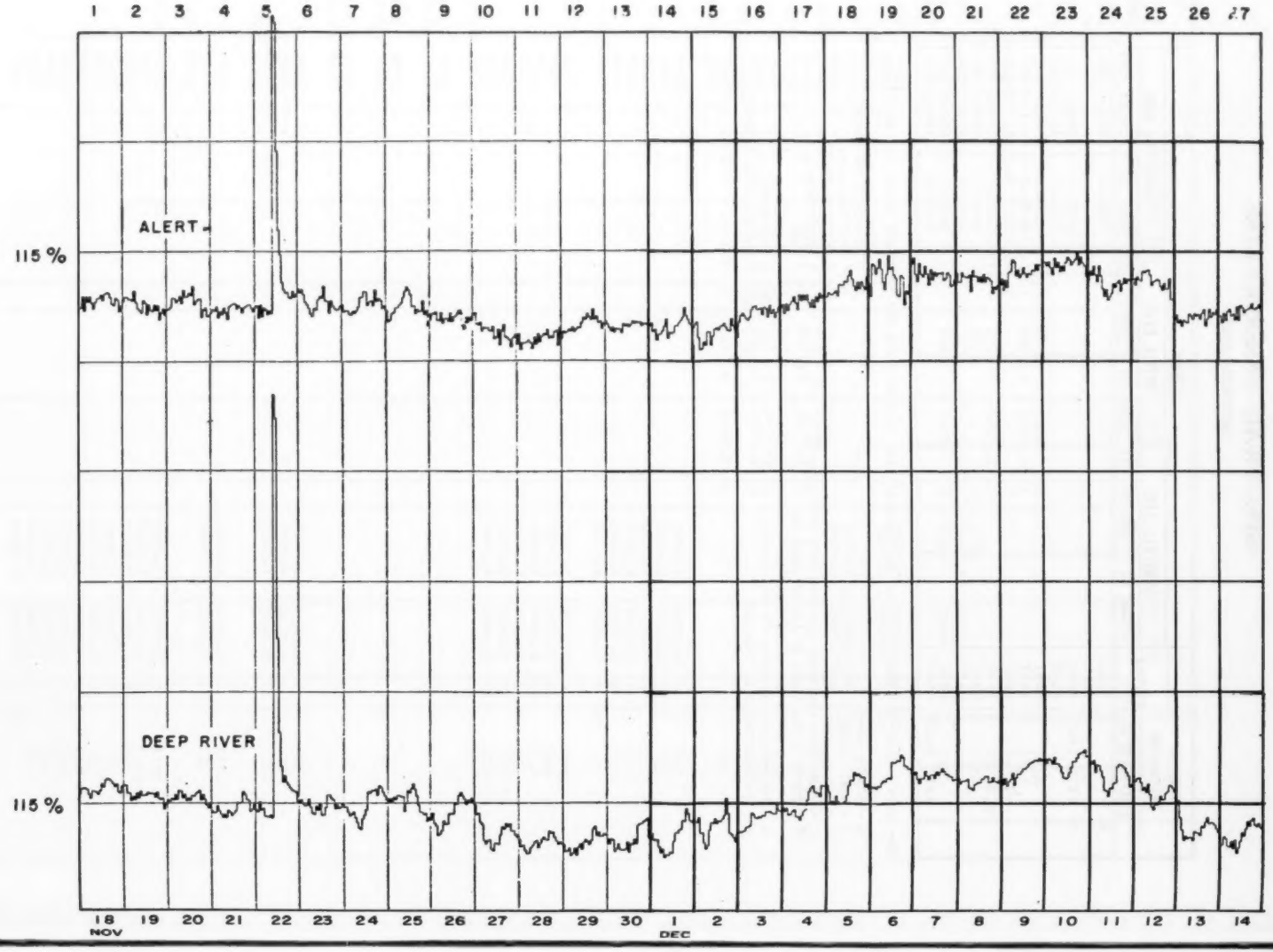
	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
8			MANI							2355.9	2356.1	2	III
9	0000	0837	MANI							0000.1	0000.3	2	III
			MANI							0034.7	0035.9	3	CONT
			MANI							0044.6	0045.2	1	II
			MANI							0109.5	0111.2	1	II
			MANI							0117.0	0117.2	2	II
			MANI							0221.0	0223.8	1	II
			MANI							0325.5	0329.0	2	II
			MANI							0421.0	0421.3	1	III
			MANI							0650.5	0652.5	2	IIIG
	2230	2400	MANI							2333.9	2334.1	1	III

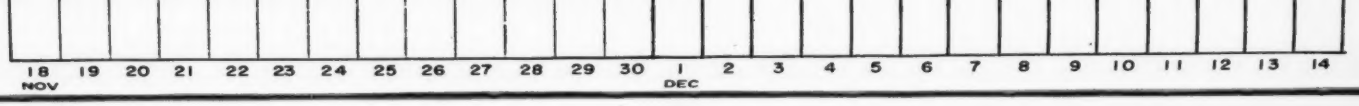
The symbols used in connection with the spectral type in describing the important bursts are as follows:

B = Single burst
G = Small group (< 10) of bursts
GG = Large group (> 10) of bursts
C = Underlying continuum (particularly with type I)
S = Storm in the sense of intermittent but apparently connected activity
N = Intermittent activity in this period
U = U-shaped burst of Type III
RS = Reverse slope burst
DP = Drifting pairs
DC = Drifting Chains
H = Herringbone
W = Weak
P = Pulsations
CONT = Continuum
UNCLF = Unclassified activity

COSMIC RAY INDICES
(Neutron Monitors)

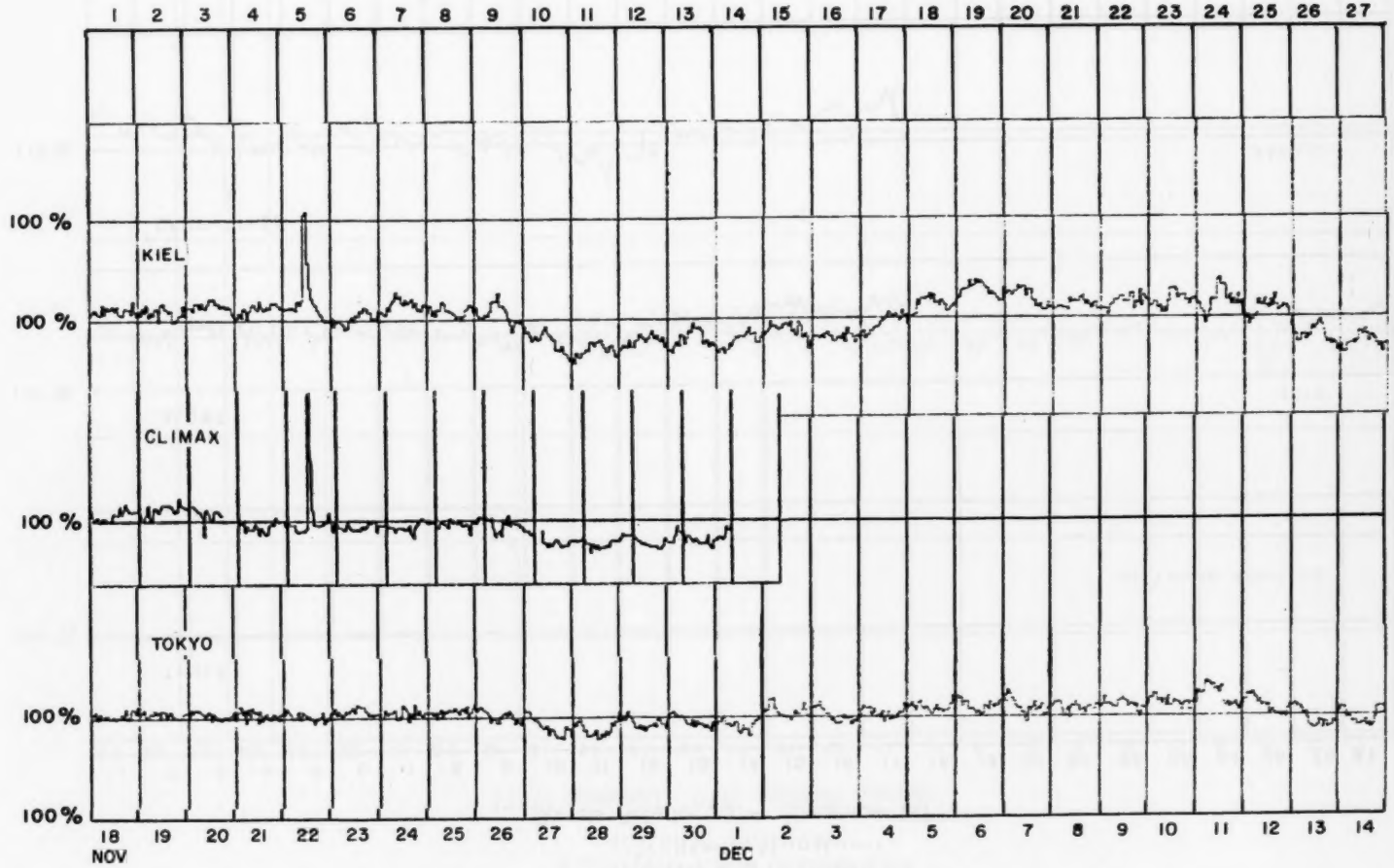
Bartels Rotation 1973 (November-December 1977)





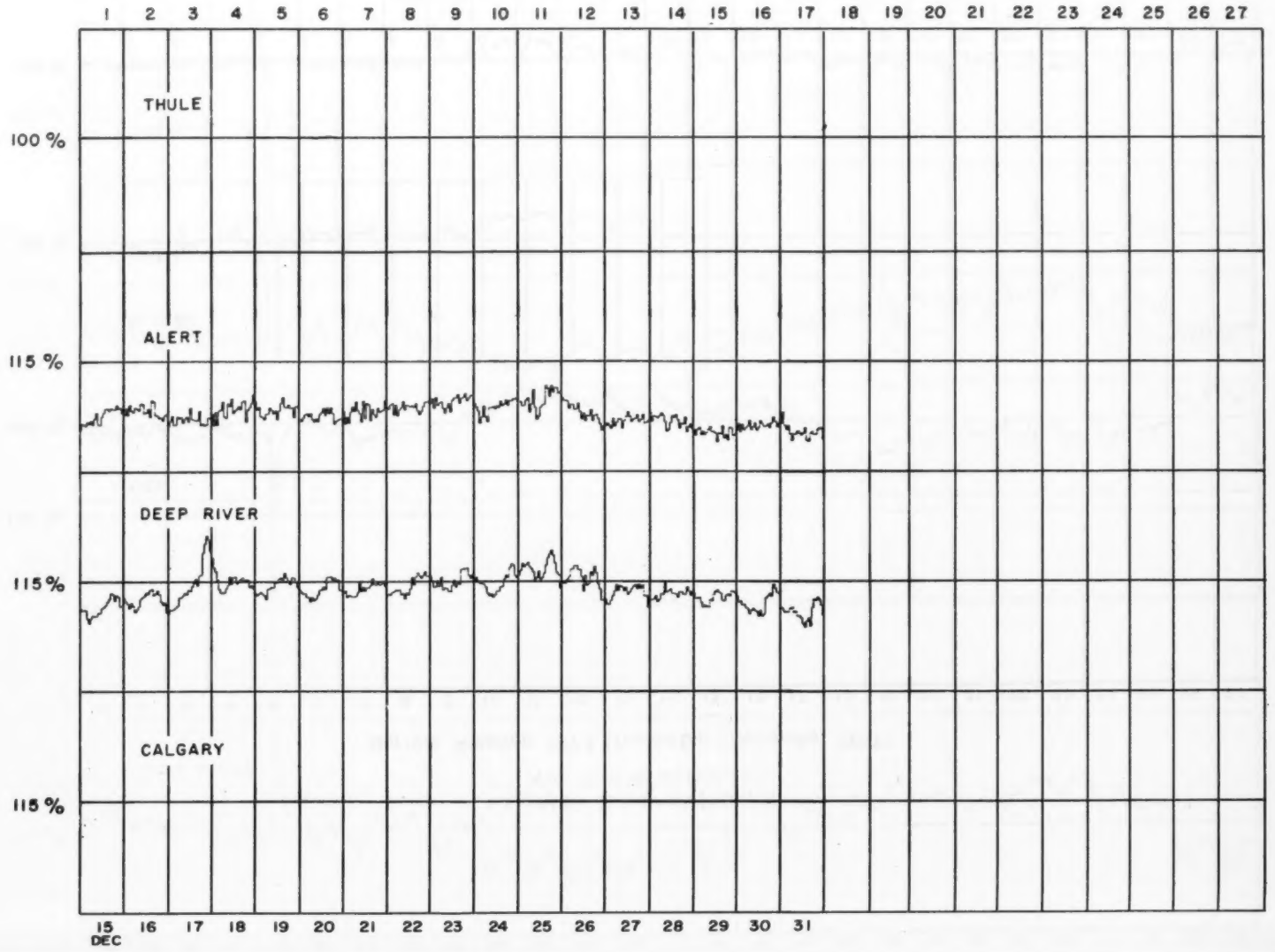
COSMIC RAY INDICES
(Neutron Monitors)

Bartels Rotation 1973 (November - December 1977)



COSMIC RAY INDICES
(Neutron Monitors)

Bartels Rotation 1974 (December 1977)



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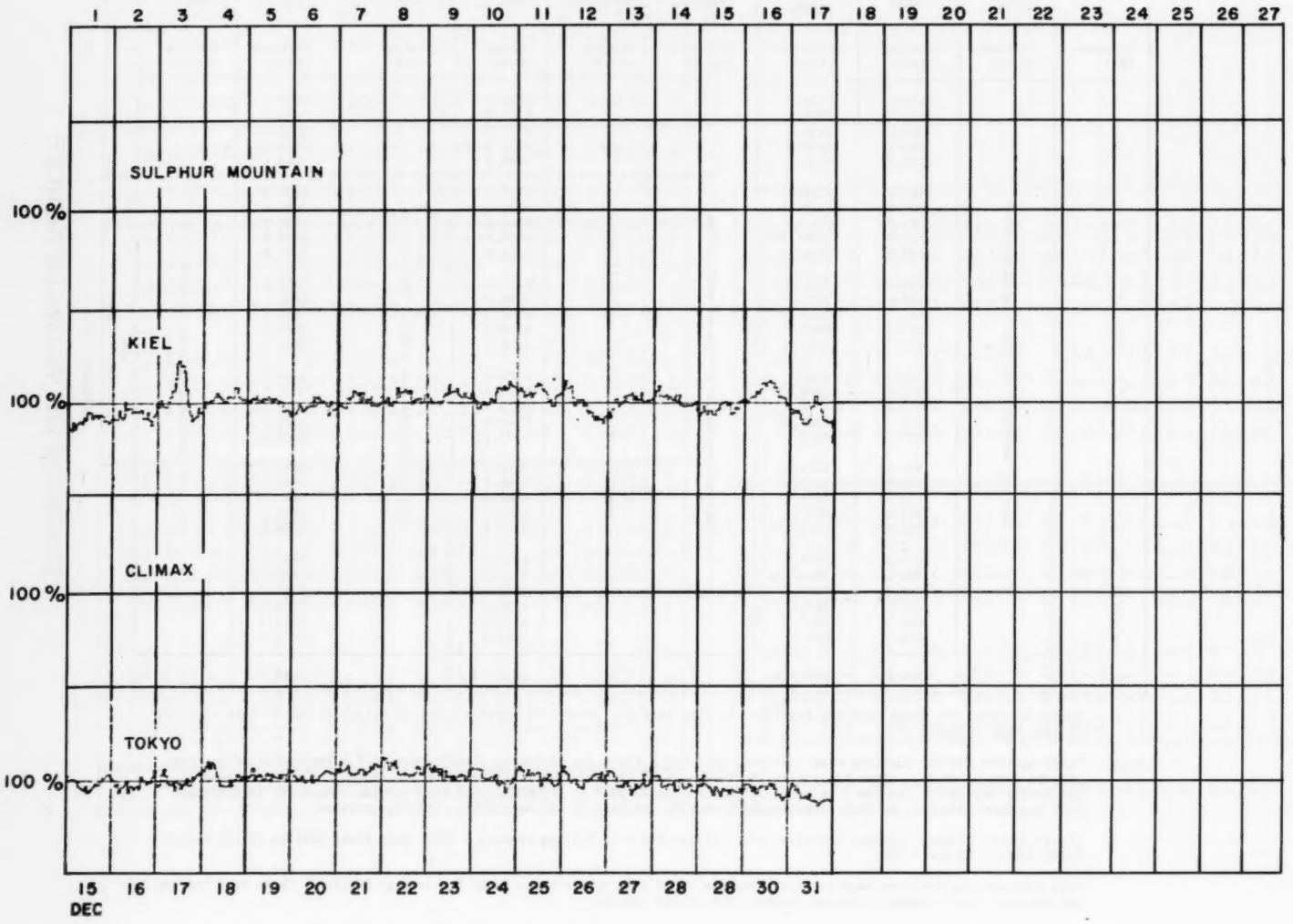
Dec 77

COSMIC RAY INDICES
(Neutron Monitors)

Bartels Rotation 1974 (December 1977)



COSMIC RAY INDICES

(Neutron Monitors)

DECEMBER 1977

December 1977	THULE Average cts/hr	ALERT Average cts/hr	DEEP RIVER Average cts/hr	CALGARY Average cts/hr	SULPHUR MT Average cts/hr	KIEL Average cts/hr	CLIMAX Average cts/hr	TOKYO Average cts/hr	KULA Average cts/hr
1		7450.6	6984.0			6296.0		3652.7	
2		7433.5	7008.9			6327.7		3675.4	
3		7490.4	7034.6			6305.7		3668.0	
4		7526.1	7078.8			6352.0		3673.9	
5		7571.5	7115.1			6408.5		3683.6	
6		7595.3	7158.4			6453.8		3686.0	
7		7607.5	7152.1			6428.3		3684.6	
8		7591.2	7135.2			6406.0		3682.5	
9		7612.3	7166.1			6415.4		3686.8	
10		7639.8	7188.3			6418.9		3691.5	
11		7583.7	7153.3			6417.4		3703.1	
12		7588.1	7107.0			6388.0		3683.8	
13		7480.1	7008.0			6302.5		3659.5	
14		7497.3	6987.5			6283.4		3663.2	
15		7513.2	7002.5			6282.1		3656.3	
16		7528.3	7024.1			6303.6		3654.2	
17		7502.0	7068.0			6362.8		3659.7	
18		7533.8	7075.6			6355.7		3669.5	
19		7532.3	7063.5			6341.5		3670.4	
20		7512.4	7053.6			6327.2		3669.5	
21		7526.4	7055.1			6347.7		3682.6	
22		7540.9	7063.5			6356.7		3683.2	
23		7558.0	7077.6			6360.6		3674.5	
24		7541.9	7072.6			6364.4		3665.4	
25		7564.5	7112.4			6370.6		3668.8	
26		7525.6	7084.9			6329.7		3664.5	
27		7500.0	7046.8			6346.2		3656.7	
28		7499.2	7042.0			6349.3		3651.8	
29		7464.2	7031.3			6322.2		3643.5	
30		7486.3	7015.5			6373.6		3643.3	
31		7468.4	6992.5			6297.8		3627.9	
MEAN		7531.1	7069.6			6354.7		3668.9	

Data not available at time of publication.

( ) Number of hours for which data are available if less than 24. Number of Section Hours at Climax if sum of both sections is less than 40 hours.

Notes: Tokyo neutron monitor counting rate increased by 2.0/1.5 since the beginning of September 1977. The number of counters changed from 27 to 36. Since the scaling factor has been changed, the listed figures are nearly the same as those in and before May 1977. The level in June, July, and August, 1977 is slightly lower than before. The level in September 1977 has been adjusted, so that direct comparison with the data in and before May, 1977 is possible.

Thule, Alert, Calgary, Sulphur Mountain, Kiel, Climax and Kula Scaling Factors = 100. Deep River Scaling Factor = 300. Tokyo Scaling Factor = 256.

Kula data are available on magnetic tape from the World Data Center A for Solar-Terrestrial Physics. These data include the periods July 1967-December 1970 and October 1975 to the present.

GEOMAGNETIC ACTIVITY INDICES

DECEMBER 1977

Day		Three-Hourly Indices Kp									Three-Hourly Indices Km								Ap	aa *				Cp
		1	2	3	4	5	6	7	8	Sum	1	2	3	4	5	6	7	8		N	S	M		
1		1	0+	0+	0+	1-	2-	3+	3	11-	1-	0+	0+	0+	1	2+	3+	3-	6	15	13	6	23	0.3
2	Q1	5	7-	6-	4+	4+	6+	7	5-	44	4+	5	5-	4	4+	6-	6	5	69	90	72	62	101	1.7
3		3+	2+	2-	2+	2+	2-	2+	2	18	3	2-	1+	2+	2+	2-	2+	2-	9	20	18	19	20	0.5
4		1-	2	1+	1	2	3+	4	5-	19	1-	1+	1	1	2+	3	4+	4+	14	24	21	7	38	0.8
5	Q4*	4	5-	5-	3-	3-	1+	2	2	24	3	4-	3+	3-	3-	1+	2	2-	18	27	19	35	12	1.0
6	Q0	3-	2-	2-	0+	0+	0+	1	1	9	2+	2-	2-	1-	0+	1-	1	1	5	11	7	14	5	CC	0.2
7	Q4	1	1-	1-	0	0	1-	1+	1+	6-	1	1+	1	0+	0+	1	1+	2-	3	8	6	7	7	CC	0.1
8	Q1	1	0+	0+	0+	0	0+	0+	0+	3	1-	1	1	1	0+	0+	1-	0+	2	4	5	6	3	CC	0.0
9	Q6	0	2-	2	0+	0+	0+	1-	0+	6-	0+	2-	2+	1-	0+	0+	1	1-	3	7	8	10	5	CC	0.1
10	Q8	0	0+	1	1-	0+	0+	2-	2+	7-	0+	1	1	1-	1-	1-	2	3	4	9	8	4	13	C	0.1
11	Q2	4	5-	5+	5+	5+	4-	3	4+	36-	3+	4-	4+	5	5+	3+	3+	4-	38	55	35	50	41		1.4
12	Q3	4+	6-	3	3-	3	2-	2+	3-	25+	3+	4	2+	2+	3+	2+	2+	3-	21	23	31	35	19		1.1
13	Q5*	4	3	3	3-	3	4-	3+	2	25-	3	2+	3-	3-	3+	4-	3	2	16	34	22	25	31		0.9
14		3-	3-	2+	1+	2	2-	1+	1	15	2	2	2-	1+	2+	2	1+	1	8	14	11	14	11	C	0.4
15	Q9	2-	2-	2-	2-	2	1-	1-	0+	10+	1+	1+	1+	2-	2+	1	1	0+	5	9	10	11	9	CC	0.2
16		0+	1	1+	1-	2	3-	3	4-	15-	1-	1-	1+	1+	2	3-	3-	4-	9	16	11	4	23	K	0.5
17		4-	5	2	1-	1	1-	2-	2-	16+	3	4-	2-	1	1+	1	2	2-	12	17	16	25	8		0.7
18	Q2	1	1	0+	1-	0+	0+	0+	0+	4+	1-	1	1	1	1-	0+	0+	0+	3	3	6	6	4	CC	0.0
19	Q3	1-	0+	1-	0+	0+	2-	0+	1-	5	0+	1-	1+	1-	0+	2	1-	1	3	5	9	6	8	CC	0.1
20	Q5	1	0+	0+	1+	1-	1-	2-	1-	7-	1-	1-	1-	1+	1	1	1+	1	4	7	8	7	9	CC	0.1
21		1+	0+	1+	1-	1+	2-	2-	3	11+	1	0+	1+	1+	2	2-	2-	3-	6	12	12	8	17	CK	0.3
22		3+	3-	1-	0+	1	1-	1-	2-	11	3-	2-	1-	1-	1+	1	1	1+	6	9	13	15	8	KK	0.3
23	Q7	2-	0+	0	1+	2-	1	1	2-	9-	1+	0+	0+	2-	2+	1+	1+	2-	4	10	9	7	13	CC	0.1
24		2	1	1	2	1+	2-	1	1	11	1+	1+	1+	3-	1+	1+	1	1+	5	10	12	14	9	CC	0.2
25		0+	1	1+	1+	1+	1-	2+	2	10+	1-	1-	1+	1+	1+	1	2+	2	5	8	12	8	13	CK	0.2
26		3	3	2	2+	2-	2+	3-	3-	20-	2+	2+	2+	2+	2	2+	3	2+	11	22	16	20	19		0.6
27		2+	2+	2-	2-	2-	1+	1	0+	12+	2	2-	1+	2-	2	2-	1+	0+	6	9	17	18	9	C	0.3
28		1-	2-	1+	1+	1	2-	4+	3+	15+	1-	1+	1+	2-	1+	2	4+	3	10	23	24	13	34		0.6
29		3	3	1+	1	1+	1+	1+	2+	15-	3-	3-	1+	2-	1+	1+	1+	2+	8	15	16	20	12		0.4
30		2	1+	1+	1	1+	1	2-	2	12-	1+	1+	1+	1-	2-	1	2	2-	5	13	11	11	13	CC	0.2
31		1	1+	1	2	2	1	2	3-	13	1	1+	1+	2	3-	1	2-	3-	6	11	14	10	16	KC	0.3
																			10	17.5	15.9	16.8			0.44

Day	Three-Hourly Indices Kn								Three-Hourly Indices Ks							
	1	2	3	4	5	6	7	8	1	2	3	4	5	6	7	8
1	0+	0+	0	0	1	2+	3+	3-	1+	1-	1-	1-	1+	2+	3+	3-
2	4	5	5-	4	5-	6	6+	5-	5-	5	5-	4	4	6-	6	5
3	3	2-	1	2+	2+	2-	2	2-	3	1+	2-	2-	2+	1+	2+	2-
4	0+	1+	1	1	2+	3+	4-	4+	1	1+	1	1	2	3	5-	5-
5	3+	4-	3+	3-	3-	1+	2-	2-	3	4	3+	2+	3-	1+	2+	2
6	2	2-	2-	0+	0+	1-	1-	1-	2+	2-	2-	1-	1-	1	1+	1+
7	1-	1	1-	0	0	1-	1+	1+	1	1+	1+	1-	0+	1	2-	2-
8	1-	0+	1-	1-	0	0	0+	0	1	1+	1	1	0+	1-	1	1-
9	0	1+	2-	0+	0+	0+	1	0+	0+	2	3-	1+	1-	0+	1	1
10	0	0+	0+	0+	1-	1-	2-	3-	1-	1+	1+	1	1-	1-	2+	3+
11	3	4-	4+	5	5+	3+	3	3+	4-	4	5-	5	5	3+	3+	4
12	3+	4	2+	2	3	2+	2+	2+	3+	4	2+	3-	4-	3-	3-	3-
13	3	2	2+	2+	3+	3+	3+	2-	3	2+	3-	3-	3+	4-	3-	2+
14	2	2+	2	1+	2+	2	1+	1-	2+	2-	1+	1+	2+	2-	1+	1
15	1	1+	1+	2-	2+	1	1-	0	2-	2-	1+	1+	2	1+	1	1-
16	0	0+	1+	1+	2	3-	3-	3+	1+	1	1+	1	2	3-	3-	4-
17	3	4-	1+	1	1	1-	2-	2-	3+	4-	2	1	2-	1+	2+	2
18	0+	1-	0+	1-	0+	0+	0	0	1	1+	1+	1+	1	0+	1-	1-
19	0	0+	1	0+	0	2-	0+	0+	1-	1+	2-	1-	1-	2+	1-	1+
20	0+	0	0+	2-	1	1-	1+	1-	1-	1+	1+	1	1	1	1+	1+
21	1-	0	1	1-	2-	2-	1+	3-	1+	0+	2	2-	2	2	2-	3-
22	2+	2-	1-	0	1+	1-	0+	1+	3-	2	1	1+	1+	1+	1+	2-
23	1+	0	0	1+	2	1	0+	1+	1+	1-	1	2-	2+	1+	2-	2
24	1+	1-	1	2	1+	1+	1	1	2-	2-	2-	3-	1+	1+	1+	2-
25	0+	1-	1	1	1+	1	2	2-	1	1-	1+	1+	2-	1	3-	3-
26	2	2+	2-	2	2	2	3-	2+	3-	2+	3-	3-	2	3-	3	3-
27	2-	2-	1	1	2-	1+	1	0	2	2-	2-	2	2	2-	2-	1-
28	0+	1	1	1+	1+	2-	4+	3	1	2-	2	2	1+	2+	5-	3+
29	2+	3-	1	1+	1	1+	1+	2+	3-	3-	2-	2	2-	2-	2-	2+
30	1+	1	1	1-	2-	1	1+	2-	2-	2-	1+	1	2-	1+	2+	2-
31	1-	1-	1	2	2+	1	2-	2+	1	2-	1+	2	3-	1+	2-	3-

Quiet days (Q) and disturbed days (D), geomagnetic planetary three-hour-range indices (Kp) (integers alone are equivalent to those normally given with a small zero), magnetic character figures (Cp), and average amplitude (Ap) (unit 2γ) prepared by Geophysikalisches Institut at the University of Göttingen, F.R. of Germany for the International Service of Geomagnetic Indices. Ten most quiet days (Q1-Q0[10]) and five most disturbed days (D1-D5) are ordered from most quiet or disturbed, respectively. A or K means "not really quiet" (A = "Ap>6", K = "Ap ≤6 but one Kp ≥3o or two Kp values ≥3-"). An * means "not really disturbed" (Ap<20).

Geomagnetic three-hourly indices (Kn), (Ks) and (Km) as in IAGA-Bulletin No. 32 and indices (aa), "antipodal", as in IAGA-Bulletin No. 33 prepared by P. N. Mayaud of the Institut de Physique du Globe, Paris, France. Really quiet (C) and quiet but slightly disturbed three-hourly intervals (K) are given for 24-hour and 48-hour intervals centered on 12 UT.

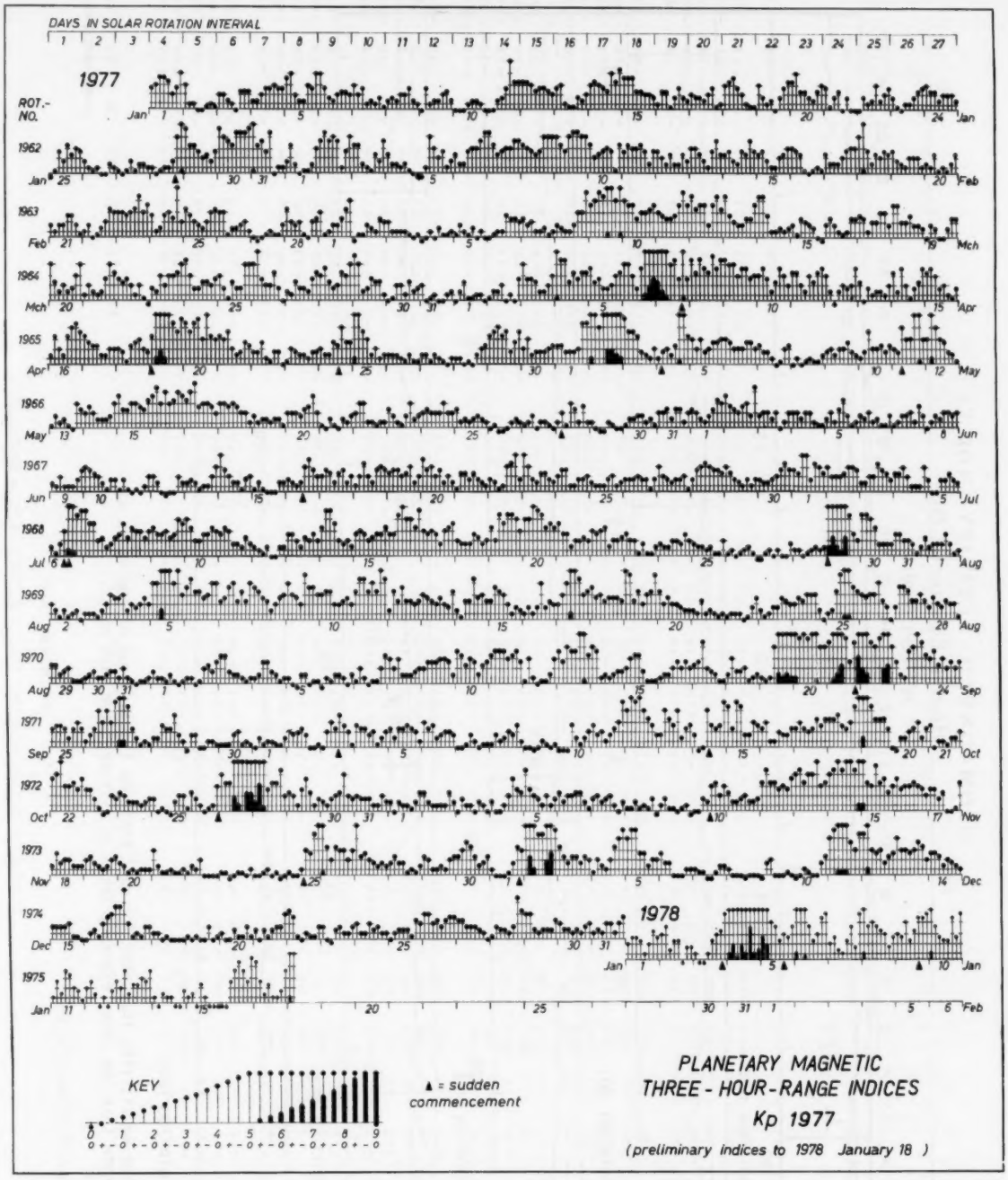
Kuta data are available on magnetic tape from ... periods July 1967-December 1970 and October 1975 to the present.

DAILY AVERAGE INDICES Ap

1977

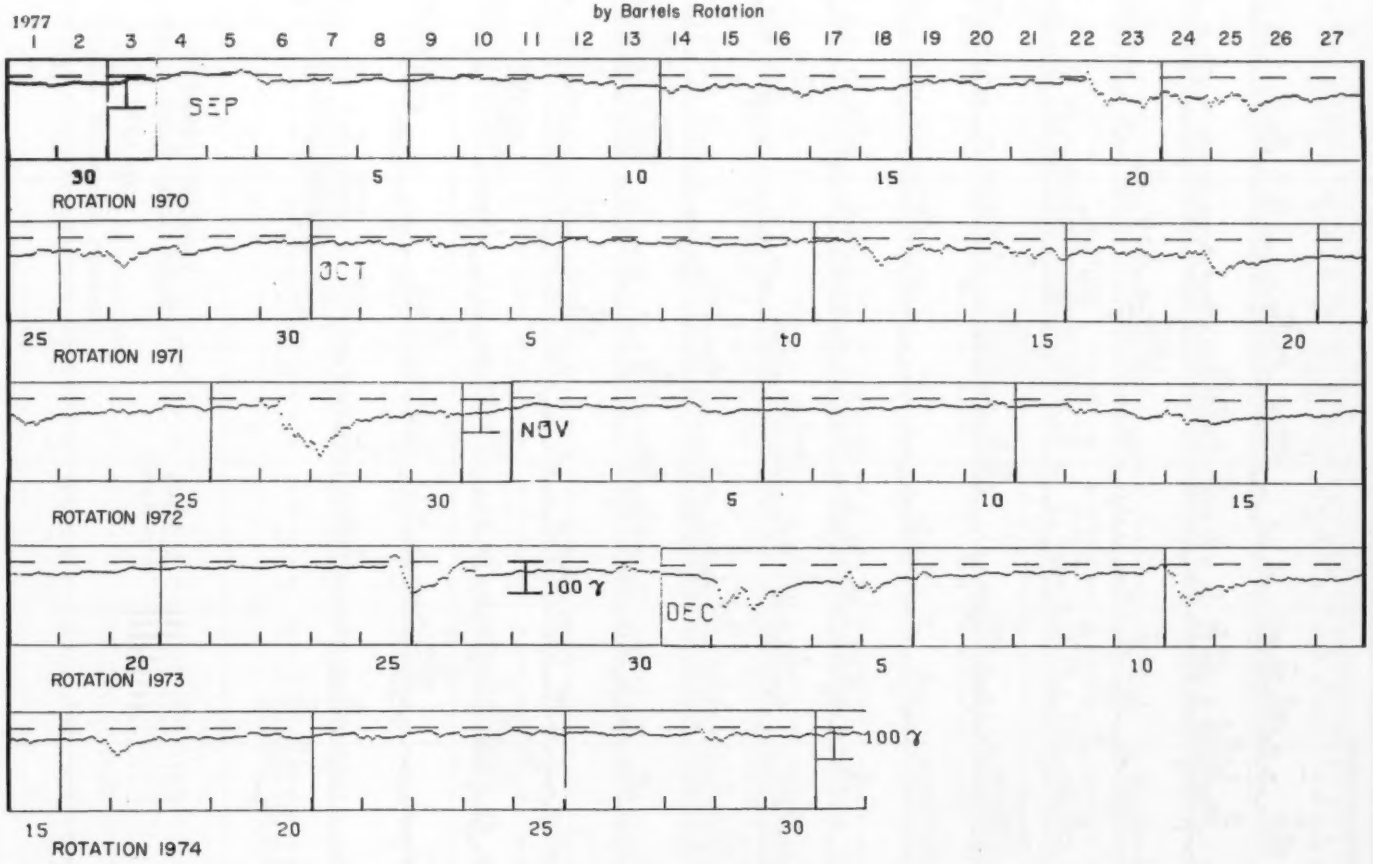
DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	17	7	11	4	13	9	15	6	4	4	5	6
2	5	21	5	5	66	14	11	4	6	5	6	69
3	6	11	4	12	15	6	9	7	8	10	4	9
4	10	4	3	24	19	5	8	9	6	7	8	14
5	15	9	4	12	11	7	5	40	3	8	10	18
6	10	14	6	49	10	5	28	21	4	6	7	5
7	7	18	5	48	6	6	15	17	6	3	5	3
8	6	18	12	27	3	6	14	12	8	6	3	2
9	6	25	38	22	7	6	16	20	11	2	3	3
10	3	12	19	13	9	8	14	12	13	4	9	4
11	14	13	18	14	24	4	10	28	19	12	6	38
12	12	7	22	8	19	4	4	11	6	28	18	21
13	7	12	13	5	6	6	9	11	28	14	26	16
14	18	11	12	12	8	9	18	12	10	13	42	8
15	13	8	5	10	14	3	12	11	9	19	25	5
16	7	6	6	17	22	10	27	9	7	8	14	9
17	6	9	9	9	18	8	14	29	10	12	8	12
18	10	17	11	8	11	10	7	13	6	22	6	3
19	8	6	5	48	5	10	23	24	42	28	6	3
20	12	5	13	28	10	11	29	8	44	7	4	4
21	5	7	10	12	4	6	10	5	64	5	5	6
22	7	8	7	6	7	10	11	5	63	22	3	6
23	6	18	14	5	7	10	6	6	21	6	2	4
24	8	14	12	11	8	7	7	10	12	6	2	5
25	9	11	12	22	5	5	5	27	10	4	15	5
26	4	8	16	4	2	6	3	13	18	6	19	11
27	4	3	8	4	4	7	3	14	24	62	12	6
28	13	7	15	4	7	12	4	7	9	47	5	10
29	15		14	18	2	7	61	6	3	9	6	8
30	30		5	8	5	9	17	5	4	9	12	5
31	19		4		7		8	4		6		6
MEAN	10	11	11	16	11	8	14	13	16	13	10	10

GEOMAGNETIC ACTIVITY INDICES



GEOMAGNETIC ACTIVITY INDICES

Hourly Equatorial Dst



Note the sensitivity indicator for each month on the last day of the month and also note that the zero reference level is different for each month.

HOURLY EQUATORIAL Dst VALUES (PROVISIONAL)

NASA/GODDARD SPACE FLIGHT CENTER

DECEMBER 1977

(Time-UT) (Units-Gammas)

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	-27	-26	-26	-26	-26	-26	-28	-30	-33	-29	-28	-28	-29	-28	-30	-30	-30	-28	-34	-38	-41	-38	-41	-42
2	-43	-49	-55	-73	-101	-123	-127	-114	-109	-99	-91	-101	-98	-86	-88	-74	-80	-103	-121	-133	-136	-121	-120	-116
3	-115	-101	-93	-84	-81	-85	-93	-94	-83	-83	-77	-73	-69	-68	-64	-65	-60	-59	-58	-54	-54	-55	-55	-54
4	-53	-53	-54	-55	-57	-52	-50	-49	-55	-56	-54	-54	-56	-58	-51	-36	-36	-24	-22	-41	-55	-63	-70	-70
5	-73	-65	-55	-61	-72	-85	-81	-72	-68	-62	-57	-56	-56	-54	-46	-45	-41	-41	-40	-40	-40	-38	-43	-45
6	-43	-45	-38	-31	-25	-24	-27	-31	-35	-39	-37	-37	-37	-37	-35	-34	-34	-32	-32	-36	-34	-35	-37	-37
7	-37	-35	-33	-35	-38	-36	-35	-31	-29	-27	-24	-25	-27	-26	-26	-26	-26	-28	-30	-32	-34	-32	-30	-25
8	-21	-22	-23	-23	-24	-24	-24	-24	-25	-27	-28	-28	-25	-25	-25	-22	-20	-22	-23	-24	-24	-25	-27	-28
9	-26	-23	-22	-22	-24	-31	-33	-42	-41	-36	-34	-34	-33	-32	-30	-26	-26	-26	-26	-27	-28	-26	-23	-22
10	-21	-22	-24	-26	-25	-26	-26	-24	-25	-26	-27	-28	-29	-27	-20	-14	-11	-12	-12	-13	-9	-3	0	-7
11	-6	-20	-27	-28	-33	-54	-86	-101	-94	-100	-117	-125	-108	-100	-90	-86	-89	-87	-80	-74	-78	-78	-76	-71
12	-66	-66	-67	-69	-80	-84	-78	-71	-66	-62	-62	-63	-66	-60	-58	-52	-52	-52	-52	-52	-52	-48	-48	-52
13	-57	-56	-43	-45	-48	-49	-49	-50	-47	-45	-39	-42	-45	-47	-43	-46	-47	-46	-50	-49	-46	-45	-44	-45
14	-44	-46	-45	-46	-45	-49	-44	-45	-49	-51	-49	-47	-46	-45	-45	-44	-43	-39	-37	-37	-35	-32	-31	-32
15	-32	-30	-34	-37	-34	-33	-30	-33	-36	-43	-41	-38	-37	-35	-35	-35	-36	-32	-32	-33	-34	-33	-33	-32
16	-33	-30	-30	-33	-36	-35	-34	-33	-33	-33	-35	-32	-29	-26	-24	-24	-30	-37	-41	-39	-35	-36	-47	-60
17	-67	-71	-81	-80	-70	-67	-66	-62	-55	-49	-47	-44	-43	-44	-41	-40	-39	-37	-36	-35	-31	-33	-26	-27
18	-31	-35	-38	-37	-33	-35	-36	-36	-36	-30	-28	-28	-28	-27	-27	-26	-29	-33	-33	-29	-27	-26	-27	-28
19	-30	-31	-33	-33	-31	-29	-29	-28	-29	-26	-27	-25	-26	-26	-25	-24	-24	-16	-13	-13	-13	-14	-16	-20
20	-22	-21	-21	-20	-19	-17	-16	-16	-17	-23	-27	-27	-28	-29	-31	-31	-31	-30	-29	-27	-28	-28	-27	-26
21	-24	-22	-21	-20	-20	-17	-17	-16	-17	-21	-22	-20	-19	-18	-18	-17	-18	-16	-15	-14	-17	-23	-30	-31
22	-33	-27	-25	-30	-37	-33	-26	-25	-29	-32	-32	-32	-31	-32	-30	-29	-27	-29	-30	-29	-25	-18	-18	-17
23	-17	-14	-13	-13	-13	-11	-10	-10	-11	-15	-19	-22	-29	-26	-23	-19	-20	-18	-17	-16	-15	-15	-23	-28
24	-30	-28	-26	-26	-26	-25	-22	-24	-22	-22	-23	-24	-25	-25	-22	-20	-23	-24	-21	-19	-16	-13	-10	-7
25	-10	-9	-10	-13	-16	-16	-17	-20	-23	-21	-17	-13	-10	-13	-12	-12	-15	-18	-16	-16	-21	-21	-24	-26
26	-21	-17	-14	-17	-15	-15	-16	-17	-17	-13	-14	-16	-14	-15	-16	-17	-20	-17	-19	-21	-25	-23	-24	-26
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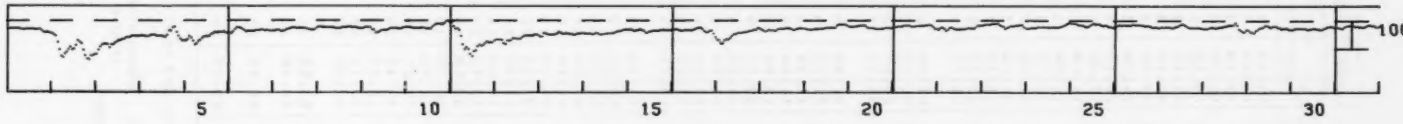


PRINCIPAL MAGNETIC STORMS

DECEMBER 1977

OBS. 2 letter IAGA code	GEOMAG-NETIC LATI-TUDE	COMMENCEMENT DAY	hr min (UT)	TYPE	SC - AMPLITUDES D(')	H(γ)	Z(γ)	MAXIMUM 3 HOUR - INDEX K DAY(3 HOUR PERIOD)	K	RANGES D(')	H(γ)	Z(γ)	UT END DAY	HOUR
CO	64.6N	1	22--	..	..	..	..	02(6)	8	373	2150	1090	03	02
SI	60.0N	1	22--	..	..	..	..	02(6)	7	--	--	530	02	23
NE	55.1N	1	22--	..	..	..	..	02(3,6,7)	6	60	306	232	03	05
WI	54.2N	1	20--	..	..	..	..	02(2,6,7,8)	6	52	300	150	02	24
FR	49.6N	1	20--	..	..	..	..	02(6,7)	6	29	176	102	05	19
IR	41.0N	1	1500	..	..	..	..	02(6)	7	28	155	91	15	00
TU	40.1N	1	20--	..	..	..	..	02(6,7)	6	18	160	25	03	05
SJ	29.9N	1	2110	..	..	..	..	02(6)	6	8	168	36	03	03
GP	24.5N	1	2000	..	..	..	..	--	-	11	160	29	03	20
HO	21.1N	1	22--	..	..	..	..	02(2)	8	3	56	5	03	--
JP	17.3N	1	2000	..	..	..	..	--	-	7	143	17	03	20
SH	14.6N	1	2000	..	..	..	..	--	-	3	143	15	03	20
UJ	13.5N	1	2000	..	..	..	..	--	-	5	154	19	03	20
AL	09.5N	1	2000	..	..	..	..	02(2,5,6,7,8)	5	5	133	26	03	20
AN	01.5N	1	2000	..	..	..	..	--	-	4	145	88	03	20
TV	01.1S	1	2000	..	..	..	..	--	-	3	260	175	03	20
PM	18.7S	1	16--	..	..	..	..	02(2,3)	6	10	150	60	03	21
GN	43.3S	1	15--	..	..	..	..	02(6,7)	6	31	110	140	03	00
TO	46.7S	1	22--	..	..	..	..	02(7)	6	33	160	120	03	15
BD	48.9N	2	20--	..	..	..	..	02(6)	6	30	199	64	03	04
GU	04.0N	2	00--	..	..	..	..	02(2)	6	10	160	30	02	24
HU	00.6S	2	0052	..	..	..	..	02(6,7)	6	14	349	60	03	02
HR	33.7S	2	02--	..	..	..	..	02(2,4,6,7,8)	5	34	185	155	02	24
GM	24.5N	4	1400	..	..	..	..	--	-	3	59	23	05	23
HO	21.1N	4	13--	..	..	..	..	05(3)	6	1	23	1	05	--
JP	17.3N	4	1400	..	..	..	..	--	-	3	52	21	05	23
SH	14.6N	4	1400	..	..	..	..	--	-	3	47	17	05	23
UJ	13.5N	4	1400	..	..	..	..	--	-	2	62	19	05	23
AL	09.5N	4	1400	..	..	..	..	04(7)	5	2	47	20	05	23
GU	04.0N	4	14--	..	..	..	..	04(8)	5	0	80	30	05	16
AN	01.5N	4	1400	..	..	..	..	--	-	3	70	31	05	23
HU	00.6S	4	1221	..	..	..	..	04(7)	6	6	228	25	05	20
TV	01.1S	4	1400	..	..	..	..	--	-	2	83	72	05	23
PM	18.7S	4	14--	..	..	..	..	04(7) 05(2)	5	18	100	50	06	09
NE	55.1N	10	2020	..	..	..	..	11(4,5)	6	49	235	335	12	08
FR	49.6N	10	21--	..	..	..	..	11(5)	6	28	103	57	13	15
BD	48.9N	10	2024	SC*	- 1	+ 6	0	11(5)	5	25	92	98	14	08
IR	41.0N	10	1900	..	..	..	..	11(4,5)	6	21	188	69	13	22
TU	40.1N	10	19--	..	..	..	..	11(1,2,4,5)	5	13	110	25	12	17
GM	24.5N	10	2000	..	..	..	..	--	-	5	207	32	12	16
HO	21.1N	10	20--	..	..	..	..	11(3)	7	2	36	2	13	--
JP	17.3N	10	2000	..	..	..	..	--	-	4	191	17	12	16
SH	14.6N	10	2000	..	..	..	..	--	-	3	215	22	12	16
UJ	13.5N	10	2000	..	..	..	..	--	-	3	189	17	12	16
AL	09.5N	10	2000	..	..	..	..	11(4,5)	6	5	164	--	12	16
GU	04.0N	10	20--	..	..	..	..	11(4)	6	0	230	20	12	15
AN	01.5N	10	2000	..	..	..	..	--	-	4	211	67	12	16
HU	00.6S	10	1343	..	..	..	..	11(5)	6	10	231	50	11	24
TV	01.1S	10	2000	..	..	..	..	--	-	3	247	104	12	16
PM	18.7S	10	20--	..	..	..	..	11(3,4,5)	5	9	190	60	13	15
HR	33.7S	10	20--	..	..	..	..	11(4,5)	5	20	143	58	12	15
GN	43.3S	10	20--	..	..	..	..	11(4,5)	6	19	150	160	12	07
CO	64.6N	11	03--	..	..	..	..	11(5)	7	296	1810	1180	12	15
SI	60.0N	11	03--	..	..	..	..	11(4)	7	130	--	570	12	15
TO	46.7S	12	01--	..	..	..	..	12(2)	5	24	145	68	13	15
HO	21.1N	16	19--	..	..	..	..	17(2)	6	5	19	3	18	--

Reports were received from the following observatories:

Alibag Annamalainagar Boulder College Fredericksburg Gnangara Guam Gulmarg Hermanus Honolulu Huancayo Irkutsk Jaipur Kerguelen Newport San Juan Shillong Sitka Toolang Trivandrum Tucson Ujjain Witteveen

RADIO PROPAGATION QUALITY INDICES

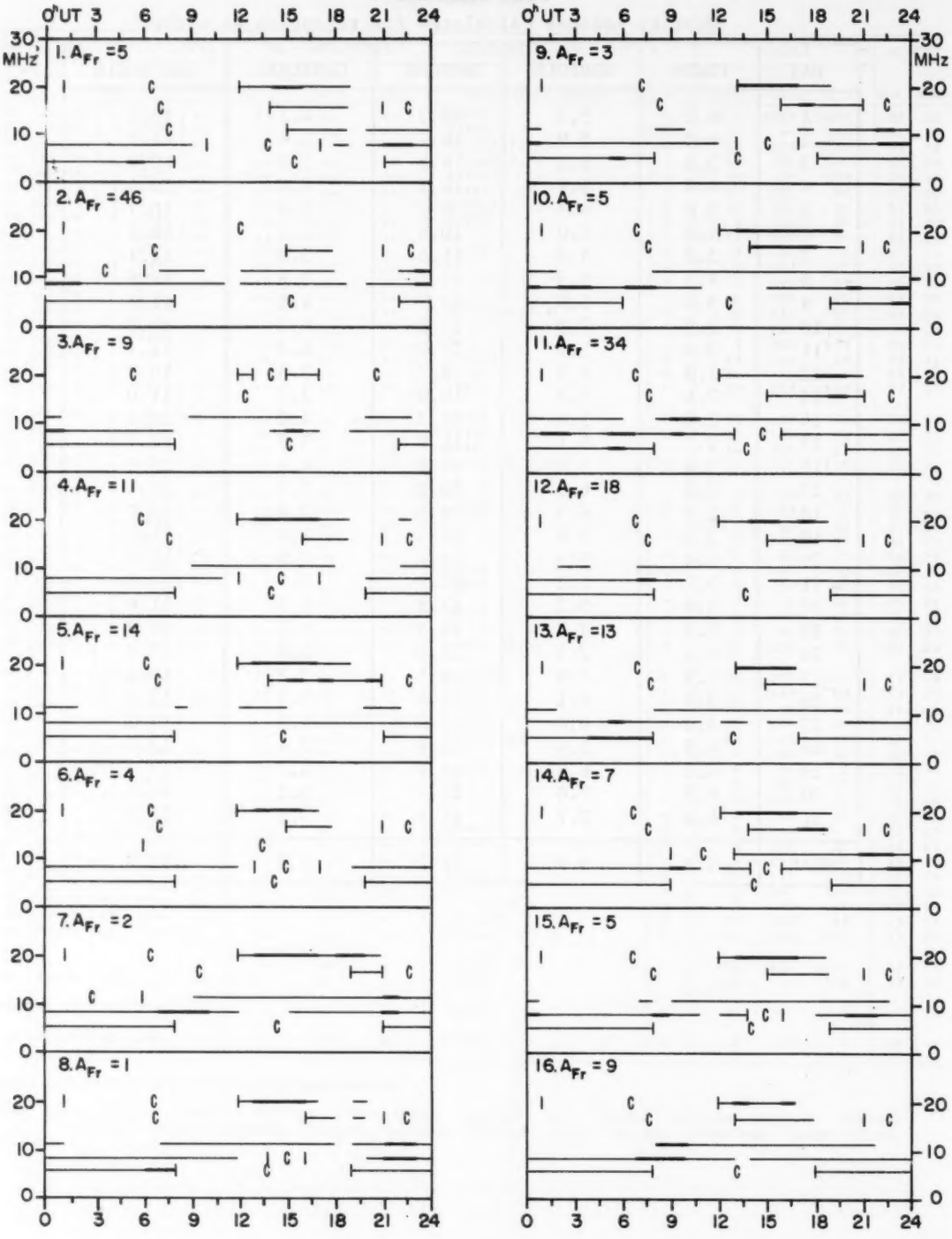
DECEMBER 1977

Quality indices calculated for reception at Lüchow

DAY	TOKYO	NORFOLK	MOSCOW	CANBERRA	BRACKNELL
1	6.1	5.5	12.7	4.1	12.0
2	4.0	5.9	10.7	3.6	11.1
3	3.8	5.1	9.6	3.5	10.9
4	4.3	5.9	10.7	4.0	12.4
5	3.6	4.9	9.7	3.6	10.7
6	4.2	4.0	10.6	3.7	11.1
7	5.0	5.9	11.5	3.8	12.1
8	4.5	5.5	11.5	3.8	11.8
9	3.6	5.9	11.7	4.0	11.8
10	3.9	7.0	11.2	4.2	11.8
11	3.6	5.7	11.2	4.2	11.1
12	3.9	6.0	9.7	3.5	10.9
13	2.6	5.7	10.9	3.7	11.0
14	2.8	5.4	11.3	4.0	12.2
15	2.7	5.1	11.8	3.9	11.7
16	3.4	5.6	11.6	4.1	12.5
17	3.1	6.1	10.2	3.7	11.4
18	2.8	6.3	9.8	3.9	11.7
19	3.0	5.9	11.3	3.4	11.2
20	3.4	5.5	11.6	3.9	11.5
21	3.2	5.2	11.7	3.7	12.0
22	3.9	5.2	11.8	4.2	11.6
23	3.8	7.1	11.5	4.1	11.9
24	3.4	7.5	11.5	3.8	12.2
25	3.9	5.9	11.5	3.2	12.2
26	3.9	6.1	11.6	3.3	12.3
27	4.0	6.0	11.3	4.0	12.2
28	4.9	5.4	11.8	3.4	12.3
29	4.3	6.2	11.7	3.7	11.9
30	4.5	7.0	11.7	3.1	12.5
31	4.6	7.7	11.8	3.5	12.5
MEAN	3.8	5.9	11.2	3.8	11.8

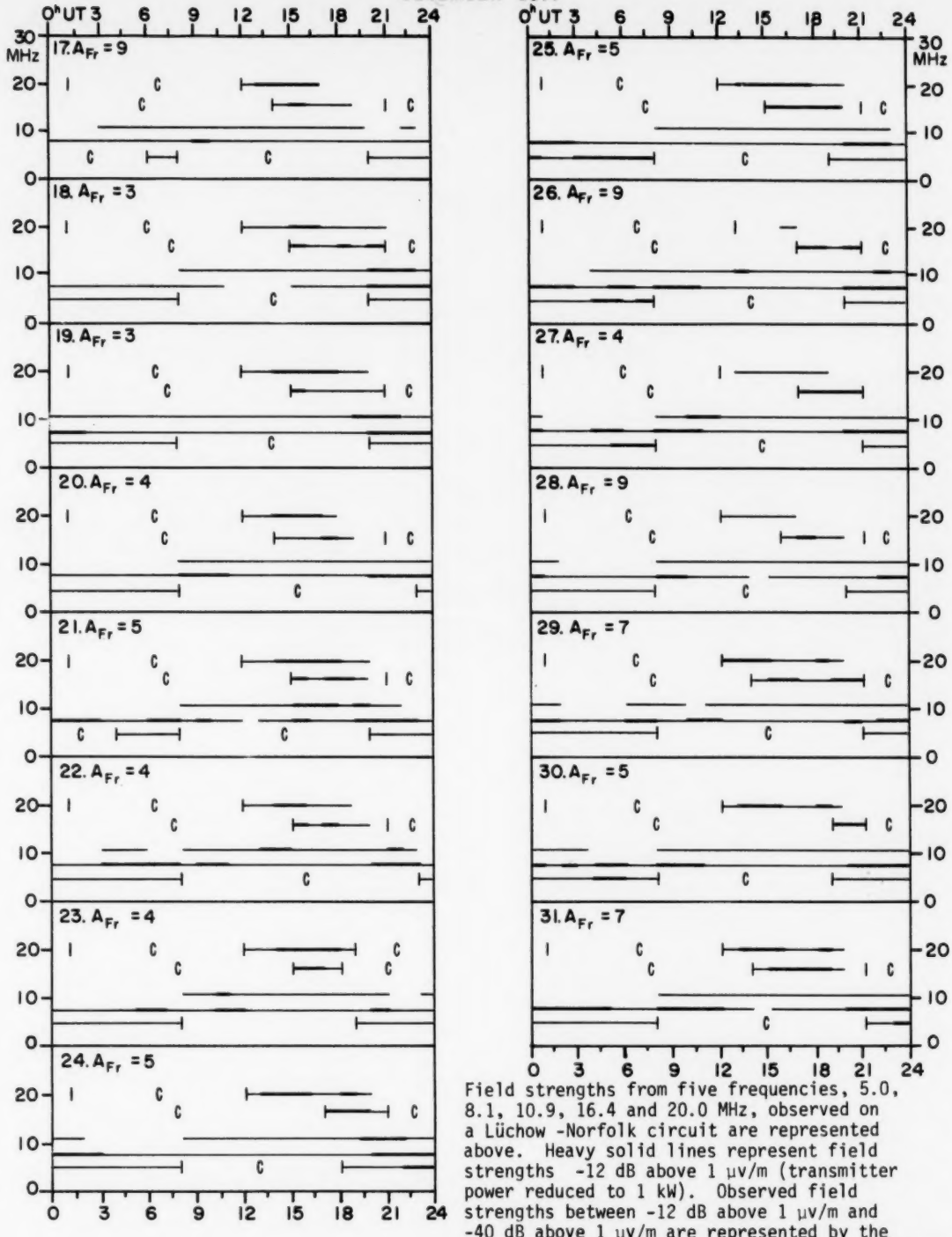
TRANSMISSION FREQUENCY RANGES -- NORTH ATLANTIC PATH

DECEMBER 1977



TRANSMISSION FREQUENCY RANGES -- NORTH ATLANTIC PATH

DECEMBER 1977



Field strengths from five frequencies, 5.0, 8.1, 10.9, 16.4 and 20.0 MHz, observed on a Lüchow -Norfolk circuit are represented above. Heavy solid lines represent field strengths -12 dB above 1 μv/m (transmitter power reduced to 1 kW). Observed field strengths between -12 dB above 1 μv/m and -40 dB above 1 μv/m are represented by the fine line. **Adapted from Observations by Deutsche Bundespost**

USCOMM-NOAA-ASHEVILLE,NC--3/3/78--950

February 1978 Number 402-Part II

Astro QB1.U57
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P-A STACKS

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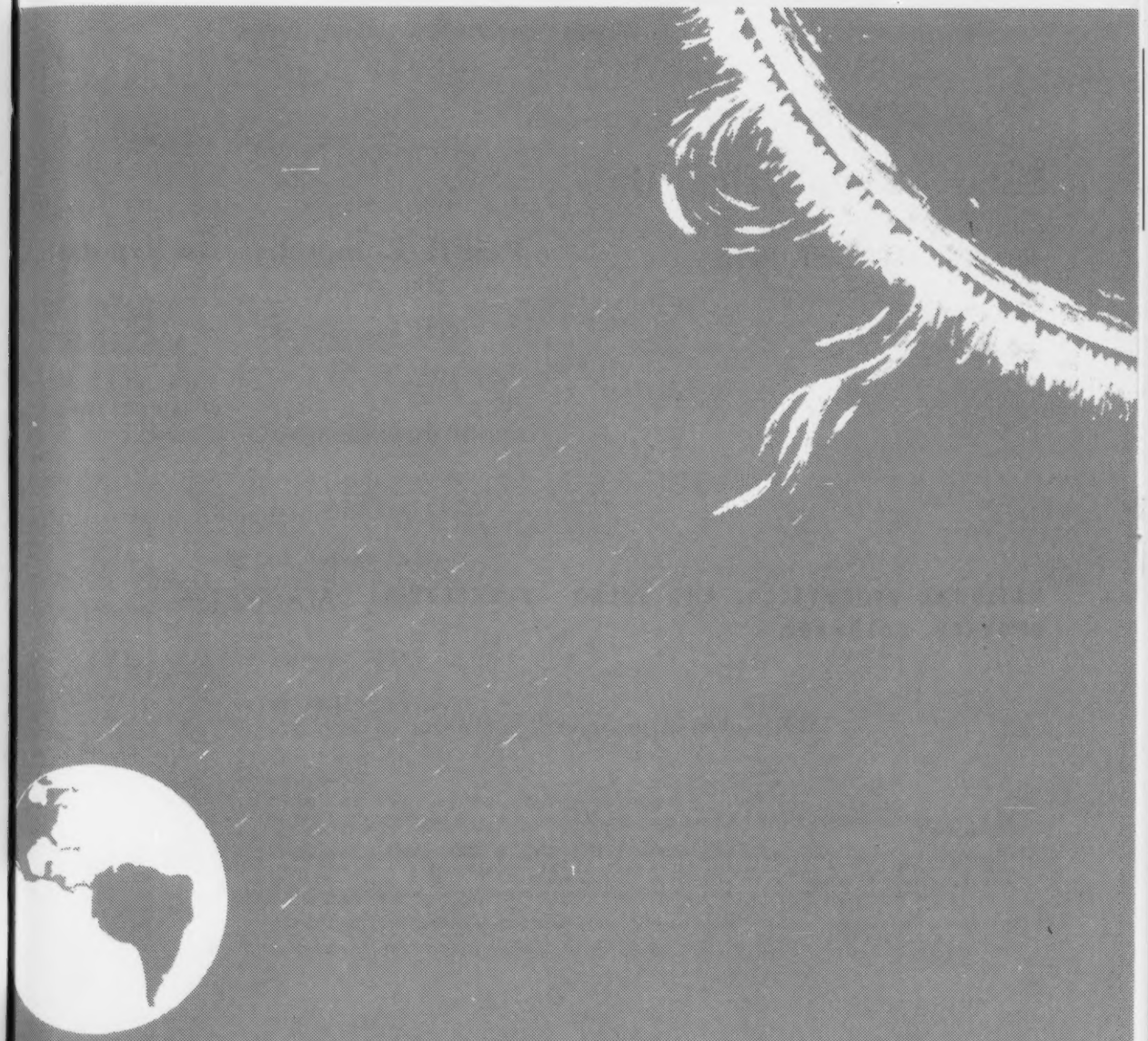
Solar-Geophysical Data comprehensive reports

Data for August 1977–July 1977 & Miscellanea

Explanation of Data Reports Issued as Number 402 (Supplement) February 1978



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NO. 402 FEBRUARY 1978

Part II (Comprehensive Reports)

DATA FOR
AUGUST 1977
JULY 1977
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To standardize referencing these reports in the open literature, the following format is recommended:

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SOLAR-GEOPHYSICAL DATA

No. 402

Issued in two parts

Helen E. Coffey, Editor

J. Virginia Lincoln, Director
Solar-Terrestrial Data Services Division

CONTENTS

PAGE

Part I (Prompt Reports)

Index for 1977 and 1978 2

Data for January 1978 3-34

Data for December 1977 35-133

Part II (Comprehensive Reports)

Index for 1977 and 1978 2

Data for August 1977 3-28

Data for July 1977 29-39

Miscellaneous Data 41-68

Solar Radio Waves
Spectral Observations Weissenau, November 1977

Cosmic Rays
Chart of Variations, Daily Values
Calgary, Sulphur Mt. -- October 1977
Alert, Deep River -- November 1977

Solar X-ray Radiation
December 1976 - June 1977

INDEX FOR 1977 AND 1978 DATA PUBLISHED IN "SOLAR-GEOPHYSICAL DATA"

		1977 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	1978 Jan
A.	SOLAR AND INTERPLANETARY PHENOMENA	391A 34	392A 28	393A 34	394A 32	395A 36	396A 35	397A 32	398A 36	399A 34	400A 30	401A 36	402A 38	
A.1	Sunspot Drawings	390A 7	391A 7	392A 7	393A 7	394A 7	395A 7	396A 7	397A 7	398A 7	399A 7	400A 7	401A 7	402A 9
A.2a	Zurich Provisional Relative Sunspot Numbers Rz													
A.2b	Zurich Final Sunspot Numbers Rz	390A 7	391A 7	392A 7	393A 7	394A 7	395A 7	396A 7	397A 7	398A 7	399A 7	400A 7	401A 7	402A 9
A.2c	American Relative Sunspot Numbers RA'	391A 34	392A 28	393A 34	394A 32	395A 36	396A 34	397A 32	398A 36	399A 34	400A 30	401A 36	402A 38	
A.3a	Mt. Wilson Magnetograms	391A 96	392A 84	393A 96	394A 92	395A 98	396A 94	397A 94	398A 98	399A 94	400A 92	401A 96	402A100	
A.3b	Mt. Wilson Magnetic Characteristics of Sunspots	391A 34	392A 28	393A 34	394A 32	395A 36	396A 34	397A 32	398A 36	399A 34	400A 30	401A 36	402A 38	
A.3c	Kitt Peak Magnetograms	390A 21	391A 29	392A 21	393A 29	394A 27	395A 29	396A 29	397A 25	398A 29	399A 29	400A 24	401A 31	
A.3d	Mean Solar Magnetic Field (Stanford)	391A 34	392A 28	393A 34	394A 32	395A 36	396A 35	397A 32	398A 36	399A 34	400A 30	401A 36	402A 38	
A.4	H-alpha Filtergrams	391A 34	392A 28	393A 34	394A 32	395A 36	396A 35	397A 32	398A 36	399A 34	400A 30	401A 36	402A 38	
A.5	Calcium Plage Drawings - McMath (or Catania)	391A 96	392A 84	393A 96	394A 92	395A 98	396A 94	397A 94	398A 98	399A 94	400A 92	401A 96	402A100	
A.5a	Calcium Plage (McMath) and Sunspot Regions	391A101	392A 88	393A100	394A 96	395A104	396A 99	397A101	398A105	399A 99	400A 99	401A100	402A105	
A.5b	McMath Daily Calcium Plage Indices	391A 32	392A 26	393A 32	394A 30	395A 34	396A 32	397A 30	398A 34	399A 32	400A 28	401A 35	402A 36	
A.6	H-alpha Synoptic Charts	3958 4	3968 4	3978 4	3988 4	3998 4	4008 4	4018 4	4028 4					
A.6b	Synoptic Chart and Active Regions (Paris)	390A 18	391A 22	392A 18	---	394A 21	---	396A 20	397A 19	398A 24	399A 24	400A 21	401A 28	402A 29
A.7f	Helium D3 Chromosphere (Big Bear)	390A 19	391A 23	392A 19	393A 23	394A 22	395A 24	396A 22	397A 20	398A 22	399A 23	400A 20	401A 27	402A 28
A.7g	Helium Synoptic Maps (KPNO)	391A 34	392A 28	393A 34	395B 36	395A 36	396A 34	397A 32	398A 36	399A 34	400A 30	401A 36	402A 38	
A.7h	Coronal Line Emission (Sac Peak)	390A 7	391A 7	392A 7	393A 7	394A 7	395A 7	396A 7	397A 7	398A 7	399A 7	400A 7	401A 7	402A 9
A.8aa	2800 MHz - Daily Values of Solar Flux (ARO-Ottawa)	390A 7	391A 7	392A 7	393A 7	394A 7	395A 7	396A 7	397A 7	398A 7	399A 7	400A 7	401A 7	402A 9
A.8ac	2800 MHz - Daily Values of Adj. Solar Flux (ARO-Ottawa)	390A 7	391A 7	392A 7	393A 7	394A 7	395A 7	396A 7	397A 7	398A 7	399A 7	400A 7	401A 7	402A 9
A.8g	Daily Values of Adjusted Solar Flux (AFGL)	391A 34	392A 28	393A 34	394A 32	395A 36	396A 35	397A 32	398A 36	4008 57	4008 57	4008 30	4018 36	4028 38
A.9cb	8.6 mm Radio Maps of the Sun (NOSC - La Posta)	391A 34	392A 28	393A 34	394A 32	395A 36	396A 35	397A 32	398A 36	4008 52	4008 30	4018 36	4028 38	
A.9d	2 cm Radio Maps of the Sun (NOSC - La Posta)	390A 12	391A 13	392A 12	393A 13	394A 12	395A 14	396A 12	397A 13	398A 14	399A 14	400A 12	401A 15	402A 16
A.10a	169 MHz - Interferometric Observations (Nancay)	3918 43	391A 15	3938 35	393A 15	394A 14	395A 16	396A 14	397A 15	398A 16	399A 16	400A 14	401A 17	402A 19
A.10c	21 cm East-West Solar Scans (Fleurs)	3918 44	391A 16	3938 36	393A 16	394A 15	395A 17	396A 15	397A 16	398A 17	399A 17	400A 15	401A 18	402A 20
A.10d	43 cm East-West Solar Scans (Fleurs)	390A 13	391A 14	392A 13	393A 14	394A 13	395A 15	396A 13	397A 14	398A 15	399A 15	400A 13	401A 16	402A 18
A.10e	10.7 cm East-West Solar Scans (Ottawa-ARO)													402A 17
A.10f	3 cm East-West Solar Scans (Toyokawa)	390A 15	391A 19	392A 15	393A 20	394A 18	395A 21	396A 17	---	398A 25	399A 20	400A 17	401A 22	402A 24
A.11g	Solar X-ray (SMS/GOES)	391A 34	392A 28	393A 34	394A 32	395A 36	396A 34	397A 32	398A 36	399A 34	400A 30	401A 36	402A 38	
A.11h	Solar X-ray (OSO-8, 1978-057A)	4028 51	4028 54	4028 57	4028 60	4028 63	4028 66							
A.11i	Solar X-ray (Columbia U.)	---	391A 25	---	393A 24	394A 23	395A 26	396A 24	397A 23	---	399A 26	---	---	402A 30
A.12ba	Cosmic Ray Protons (Pioneers 6 & 7)	---	391A 27	---	393A 26	394A 24	395A 27	396A 25	---	---	399A 27	---	---	402A 31
A.12bb	Cosmic Ray Protons (Pioneers 8 & 9)	3958 17	3968 20	3978 15	3988 22	3998 18	4008 34	4018 20	4028 24					
A.12e	Energetic Solar Particles (IMP H & J)	---	391A 25	---	393A 24	394A 23	395A 26	396A 24	397A 23	---	399A 26	---	---	402A 30
A.13a	Solar Wind (Pioneers 6 & 7)	---	391A 27	---	393A 26	394A 24	395A 27	396A 25	---	---	399A 27	---	---	402A 31
A.13ab	Solar Wind (Pioneers 8 & 9)	390A 24	391A 24	392A 23	393A 27	394A 25	395A 31	396A 27	397A 27	398A 27	399A 25	400A 25	401A 29	402A 34
A.13d	Solar Wind from IPS Measurements	3958 17	3968 19	3978 15	3988 21	3998 17	4008 33	4018 19	4028 23					
A.13e	Solar Plasma (IMP H & J)	---	---	---	---	---	395A 27	396A 25	---	---	---	---	---	---
A.17	Interplanetary Magnetic Field (Pioneer 8)	---	---	---	---	---	395A 27	396A 25	---	---	---	---	---	402A 31
A.17	Interplanetary Magnetic Field (Pioneer 9)	390A 20	391A 28	392A 20	393A 28	394A 26	---	396A 26	397A 24	398A 28	400A 22	400A 22	401A 30	402A 32
A.17c	Inferred IP Magnetic Field	---	---	---	---	---	395A 27	396A 25	---	---	399A 27	---	---	--
A.18	Interplanetary Electric Field (Pioneer 8)	---	391A 27	---	393A 28	394A 24	---	396A 26	---	---	---	---	---	402A 31
A.18	Interplanetary Electric Field (Pioneer 9)													
B.	IONOSPHERIC (AND RADIO WAVE PROPAGATION) PHENOMENA	391A118	392A104	393A122	394A118	395A122	396A118	397A120	398A124	399A128	400A120	401A116	402A132	
B.52	Graphs of Transmission Frequency Range	391A120	392A103	393A121	394A120	395A124	396A120	397A122	398A126	399A127	400A122	401A118	402A131	
B.53	Quality Figures Based on Frequency Ranges													
C.	FLARE-ASSOCIATED EVENTS	390A 10	391A 11	392A 10	393A 10	394A 10	395A 10	396A 10	397A 10	398A 10	399A 10	400A 10	401A 10	402A 12
C.1a	Optical Observations Flares	3958 8	3968 8	3978 8	3988 8	3998 8	4008 8	4018 8	4028 8					
C.1ba	Optical Observations Flares (Standardized Data)	390A 11	391A 12	392A 11	393A 12	394A 11	395A 13	396A 11	397A 12	398A 13	399A 13	400A 11	401A 14	402A 15
C.1d	Flare Patrol Observations	3958 13	3968 13	3978 11	3988 14	3998 13	4008 19	4018 15	4028 17					
C.1d	Flare Patrol Observations	3958 12	3968 12	3978 10	3988 13	3998 12	4008 18	4018 14	4028 16					
C.1e	Flare Indices (by day)	3968 35	3978 31	3988 41	3998 33	4008 49	4018 35	4028 39						
C.1f	Flare Indices (by Region)	3958 14	3968 14	3978 12	3988 15	3998 14	4008 20	4018 16	4028 18					
C.3	Solar Radio Waves - Outstanding Occurrences	390A 14	391A 17	392A 14	393A 17	394A 16	395A 18	396A 16	397A 17	398A 18	399A 18	400A 16	401A 19	402A 21
	Solar Radio Waves - Fixed Frequencies - Selected	393B 40	393B 41	393A100	394A105	396B 41	398B 44	398B 46	399B 36	399A113	401B 44			
C.3t	43.25, 80 and 160 MHz Selected Bursts (Culgoora)	391A103	392A 90	393A102	394A 98	395A106	396A102	397A103	398A107	399A102	400A101	401A102	402A108	
C.4a	Solar Radio Spectral Obs. (Fort Davis)	391A103	393B 37	393A102	394A 98	396B 38	397B 34	397A103	400B 62	399A102	401B 38			
C.4d	Solar Radio Spectral Obs. (Culgoora)	391A103	392A 90	393A102	394A 98	395A106	397B 34	397A103	398A107	399A102	400A101	402B 42	402A108	
C.4e	Solar Radio Spectral Obs. (Weissenau)	391A103	392A 90	393A102	394A 98	395A106	396A102	397A103	398A107	399A102	400A101	401A102	402A108	
C.4f	Solar Radio Spectral Obs. (Sagamore Hill)	391A103	392A 90	393A102	394A 98	395A106	396A102	397A103	398A107	399A102	400A101	401A102	402A108	
C.4h	Solar Radio Spectral Obs. (Dwingeloo)	391A103	392A 90	393A102	394A 98	395A106	396A102	397A103	398A107	399A102	400A101	401A102	402A108	
C.4i	Solar Radio Spectral Obs. (Durnten)	391A103	392A 90	393A102	394A 98	395A106	396A102	397A103		399A102	400A101	401A102	402A108	
C.4j	Solar Radio Spectral Obs. (Manila)	390A 17	391A 21	392A 17	393A 22	394A 20	395A 21	396A 17	397A 22	398B 37	399A 22	400A 19	401A 24	402A 26
C.5e	Solar X-ray (SMS/GOES)	4028 51	4028 54	4028 57	4028 60	4028 63	4028 66							
C.5f	Solar X-ray (Columbia U.)	391A102	392A 89	393A101	394A 97	395A105	396A100	397A102	398A106	399A100	400A100	401A101	402A106	
C.6	Sudden Ionospheric Disturbances													
D.	GEOMAGNETIC AND MAGNETOSPHERIC PHENOMENA	391A114	392A 97	393A114	394A111	395A115	397B 39	397A114	398A117	399A120	400A113	401A109	402A125	
D.1a	Geomagnetic Indices Kp, Km, Ks, Km, Ap, aa, Cp	391A116	392A 99	393A116	394A113	395A117	396A113	397A116	398A119	399A122	400A115	401A111	402A127	
D.1ba	27-day Chart of Kp Indices													
D.1c	27-day Chart of C9	391A117	392A101	393A119	394A116	395A120	396A116	397A119	398A122	399A125	400A118	401A114	402A130	
D.1d	Principal Magnetic Storms					---								
D.1e	Reduced Magnetograms	392B 38	392A102	393A120	394A117	395A121	396A117	398B 47	398A123	399A126	400A119	401A115	402A129	
D.1f	Sudden Commencement and Solar Flare Effects		392A100	393A118	394A115	395A119	396A115	397A116	398A121	399A124	400A117	401A113		
D.1g	Equatorial Indices Dst													
F.	COSMIC RAYS	391A109	393B 44	393A109	394A110	395A114	396A110	397A109	398A116	399A115	400A112	402B 47	402A125	
F.1a	Cosmic Ray Neutron Counts (Deep River)	391A109	392A 96	393A109	394A110	395A114	396A110	397A109	398A116	399A115	400A112	401A108	402A124	
F.1b	Cosmic Ray Neutron Counts (Climax)	391A109	393B 44	393A109	394A110	395A114	396A110	397A109	398A116	399A115	400A112	402B 47	402A124	
F.1e	Cosmic Ray Neutron Counts (Alert)	393B 44	394B 36	394B 36	394A110	395A114	396A110	397A109	400B 70	400B 70	402B 47			
F.1f	Cosmic Ray Neutron Counts (Calgary)	393B 44	394B 36	394B 36	394A110	395A114	396A110	397A109	400B 70	---	402B 47			
F.1g	Cosmic Ray Neutron Counts (Sulphur Mountain)													
F.1h	Cosmic Ray Neutron Counts (Thule)	391A109	392A 96	393A109	394A110	395A114	396A110	397A109	398A116	399A115	400A112	401A108	402A124	
F.1i	Cosmic Ray Neutron Counts (Kiel)	391A109	392A 96	393A109	394A110	395A114	396A110	397A109	398A116	399A115	400A112	401A108	402A124	
F.1j	Cosmic Ray Neutron Counts (Tokyo)					395A114	396A110	397A109	398A116					
F.1k	Cosmic Ray Neutron Counts (Kula)													
H.	MISCELLANEOUS	390A 4	391A 5	392A 5	393A 5	394A 5	395A 4	396A 5	397A 4	398A 4	399A 4	400A 4	401A 4	402A 5
H.6U	IUWDS Alert Decisions	3968 28	3978 24	3988 34	3998 26	4008 47	4018 28	4028 32						
H.62	Abbreviated Calendar Record													

Notes:

"391A 34" listed under 1977 Jan means that data for January 1977 were contained in *Solar-Geophysical Data* Number 391 - Part I, beginning on page 34.

A = Part I, B = Part II.

----- = no data available.
blank = data not yet received.

AUGUST 1977 DATA

Contents

	Page
Active Regions	4-5
Synoptic Solar Maps	6-7
Solar Flares	
Hα Solar Flares (Standardized Data)	8-15
Daily Flare Indices	16
No-Flare-Patrol Chart	17
Solar Radio Waves	
Worldwide Outstanding Occurrences at Fixed Frequencies	18-22
Energetic Solar Particles and Plasma	23-28
Solar X-ray Radiation (Data not available at time of publication)	
Magnetograms of Geomagnetic Storm (Data not available at time of publication)	

ACTIVE REGIONS

CARRINGTON ROTATION 1657

(July 10 - August 6, 1977)

Region No.	Coordinates		Age at CMP	IMP.	Spot-less Region	Region No. in Rotation 1656	Activity at West Limb
	Lat.	Long.					
1	29°S	346°	+1	1	x		dispersed
2	27 N	339	>6	1	x		disappeared
3	19 N	337	0	1	x		disappeared
4	18 N	316	+5	1	x		disappeared
5	15 S	268	-2	1	x		decreasing
6	22 N	246	-3	1	x		decreasing
7	7 S	217	0	1	x		disappeared
8	25 S	203	>6	1	x	(9+10)	decreasing
9	21 N	189	+2	2			increasing
10	11 N	183	+3	1	x		disappeared
11	21 N	181	+4	1	x		disappeared
12	30 S	162	+1	1	x		dispersed
13	12 N	151	>6	1	x	(16)	dispersed
14	20 N	139	>6	2		(16)	decreasing
15	19 S	133	-1	1	x		decreasing
16	24 S	132	>6	2			decreasing
17	17 N	130	>6	1	x		decreasing
18	26 S	124	>6	1	x		dispersed
19	17 N	121	>6	1	x		disappeared
20	29 N	116	-2	2			decreasing
21	39 N	113	-3	1	x	(17)	dispersed
22	22 N	115	>6	1	x		dispersed
23	23 N	94	>6	1	x	(21)	disappeared
24	12 N	91	-2	1	x		disappeared
25	24 N	40	>6	1	x		dispersed
26	20 N	39	+2	1	x		disappeared
27	17 S	10	+2	2			stable
28	21 S	8	-3	1	x		disappeared

ACTIVE REGIONS

CARRINGTON ROTATION 1658

(August 6 - September 3, 1977)

Region No.	Coordinates Lat.	Coordinates Long.	Age at CMP	IMP.	Spot-less Region	Region No. in Rotation 1657	Activity at West Limb
1	31°N	346°	+4	1	x		disappeared
2	25 N	328	>6	4			decreasing
3	22 S	282	+3	1	x		disappeared
4	22 N	266	0	1	x		disappeared
5	22 N	248	>6	1	x	(6)	dispersed
6	19 N	241	+1	4			increasing
7	18 N	236	+6	1	x		dispersed
8	26 S	233	>6	1	x		dispersed
9	6 S	224	-2	1	x		disappeared
10	35 N	220	+5	1	x		disappeared
11	26 N	214	+5	2			decreasing
12	32 N	210	>6	2			decreasing
13	25 S	209	>6	1	x		dispersed
14	22 S	208	-2				decreasing
15	20 N	201	-2	1	x		dispersed
16	22 N	191	>6	2			decreasing
17	31 S	190	>6	1	x		dispersed
18	36 N	190	>6	1	x		dispersed
19	21 N	176	+4	2			decreasing
20	21 N	161	-2	2			decreasing
21	28 S	150	+6	1	x		dispersed
22	20 N	146	>6	1	x	(14)	dispersed
23	27 S	127	>6	1	x	(15+16+18)	dispersed
24	26 N	117	-1	2			stable
25	27 S	98	>6	3			decreasing
26	38 N	86	0	1	x		disappeared
27	42 N	78	+2	1	x		disappeared
28	21 N	69	-2	1	x		dispersed
29	26 N	66	-3	2			decreasing
30	17 S	65	-3	1	x		disappeared
31	21 N	49	>6	1	x	(25)	decreasing
32	32 S	39	+5	2			decreasing
33	19 S	16	+5	1	x		disappeared

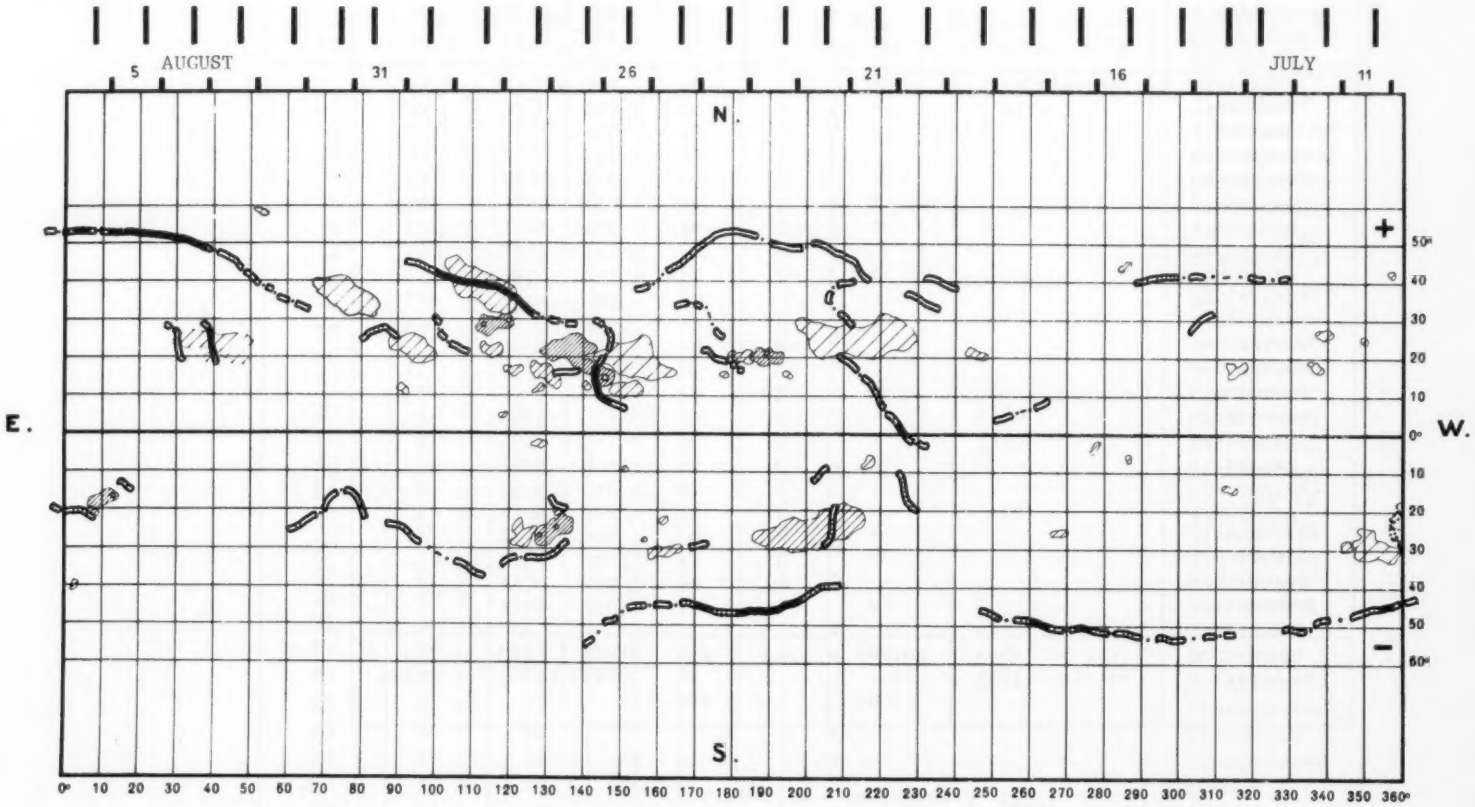
Aug 77 6

SYNOPTIC SOLAR MAP

CARRINGTON ROTATION 1657

JULY 10 TO AUGUST 6, 1977

MEUDON OBSERVATORY

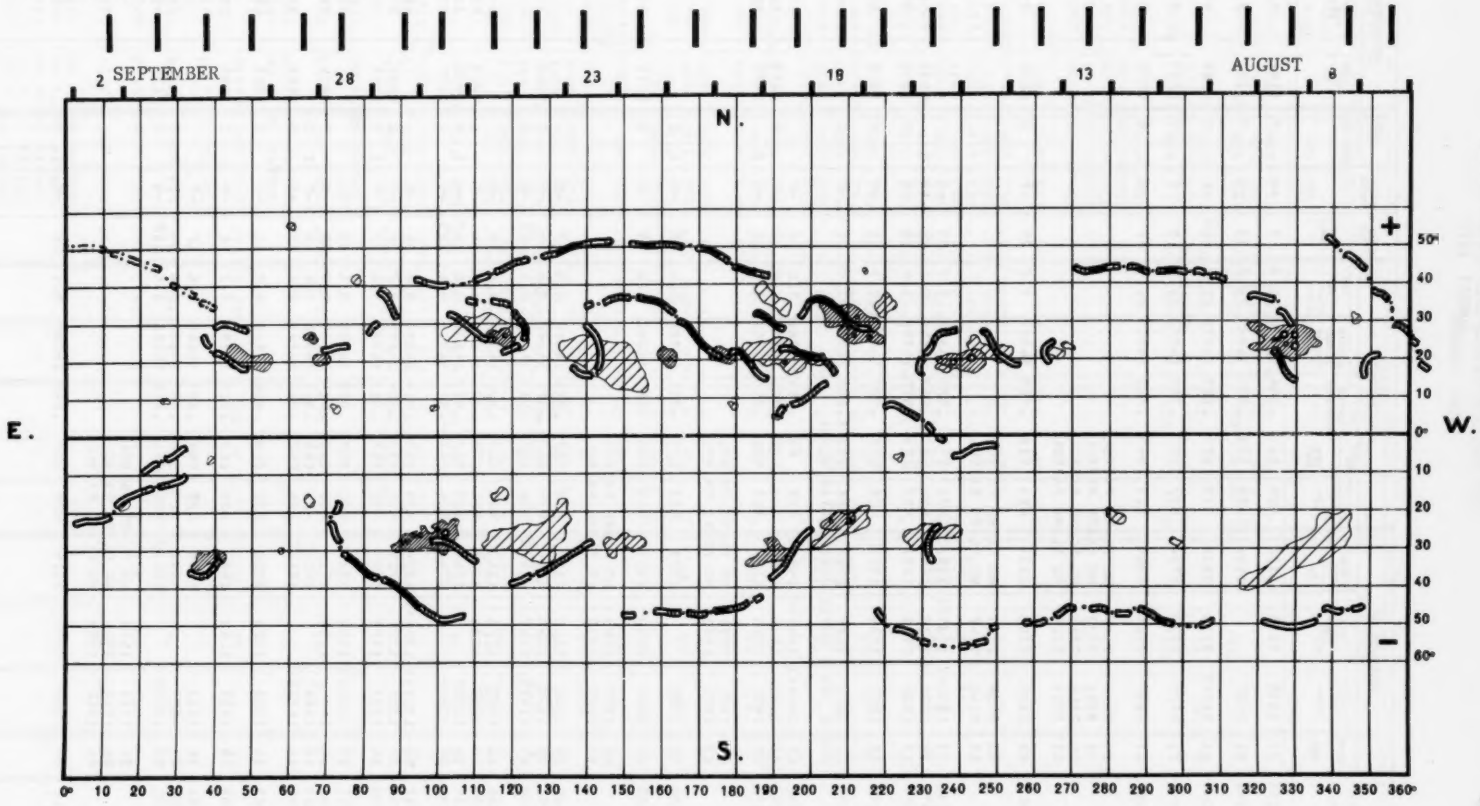


SYNOPTIC SOLAR MAP

CARRINGTON ROTATION 1658

AUGUST 6 - SEPTEMBER 3, 1977

MEUDON OBSERVATORY



7 Aug 77

Hα SOLAR FLARES

AUGUST 1977

OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS	
	DATE AUG	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMR DAY	MIN.		CONG	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.		
333 MITK	01	0058	0101	0103	N28	W40	.694	14883	29.0	5	-N		P	0101	80	1.2	D	Y5
334 MITK	01	0137		0148	N28	W38	.673	14883	29.2	11	-N		P	0137	50	.7	D	Y5
335 MONT	01	0658E	0714	0804	S19	W58	.885	14874	27.9	66D	-F		C	0714	40		EGHK	Y5
336 MONT	01	0725	0729	0734	N27	W42	.710	14883	29.2	9	-F		C	0729	20		DH	Y5
337 MONT	01	0857	0920	0944	S19	W59	.892	14874	27.9	47	-N		C	0920	80		EG	Y5
	01	2112	2127	NO FLARE PATROL														
	01	2301	2303	NO FLARE PATROL														
	01	2316	2317	NO FLARE PATROL														
	01	2319	2325	NO FLARE PATROL														
338 CULG	02	2205	2209	2230	N18	E10	.269	14880	3.7	25	-F		C	2209	30	.3		Y5
	03	0135	0137	NO FLARE PATROL														
	03	0140	0142	NO FLARE PATROL														
GRP64339	03	1030+1	1035+6	1053	N21	E78	.973	14888	9.3	23	-N							
CATA	03	1030	1035	1055	N21	E77	.969	14888	9.2	25	1N	2		1035	56			
ZURI	03	1031	1041	1051	N22	E79	.977	14888	9.4	20	-F		C	1041	20			
340 ZURI	03	1035	1039	1051	N28	W70	.937	14883	29.2	16	-N		C	1039	14			Y5
341 LOCA	03	1429	1432	1440	S21	W90	1.001	14874	27.9	11	? N		V				A	Y5
	IMP.1 NO		ZURI2	HUAN2	CATA1	MCMA1												
GRP64342	03	1449+1	1449+6	1459	N18	00	.209	14880	3.6	10	-F				20	.2		
ZURI	03	1449	1449	1457	N19	E00	.226	14880	3.6	8	-F		C	1449	14	.2		
CATA	03	1450	1455	1500	N18	W01	.210	14880	3.5	10	-N	2		1455	28	.3		
	03	1829	1838	NO FLARE PATROL														
	03	1851	1853	NO FLARE PATROL														
343 HUAN	03	1908		1928	N23	E75	.961	14888	9.4	20	-F	1	C					Y5
344 VORO	03	2207	2210	2216	N19	E09	.272	14880	4.6	9	-N		C	2210	99	1.1	DG	Y5
	03	2237	2248	NO FLARE PATROL														
	03	2327	2330	NO FLARE PATROL														
GRP64345	04	1140	1140	1147	N25	E67	.918	14888	9.5	7	-F						D	
ZURI	04	1140	1140	1146	N25	E68	.924	14888	9.6	6	-F		C	1140	35			
KHAR	04	1141E	1147	1147D	N26	E67	.919	14888	9.5	6D	-F		P				D	
GRP64346	04	1222	1228	1242	N25	E68	.924	14888	9.6	20	-N				40		D	
ZURI	04	1222	1228	1236	N25	E68	.924	14888	9.6	14	-F		C	1228	50			
HUAN	04	1230E		1244	N25	E67	.918	14888	9.5	14D	-N	1	P	1231	30			
MCMA	04	1231E		1242D	N26	E68	.925	14888	9.6	11D	-N		P	1231	25	.7	D	
GRP64347	04	1320+0	1322+1	1326	N25	E67	.918	14888	9.6	6	-F				40			
ZURI	04	1320	1322	1324	N25	E68	.924	14888	9.7	4	-F		C	1322	50			
HUAN	04	1320	1323	1327	N25	E67	.918	14888	9.6	7	-F	1	C	1323	30			
GRP64348	04	1444+0	1454	1514	N25	E67	.918	14888	9.6	30	-N				50		D	
ZURI	04	1444	1454	1514	N25	E68	.924	14888	9.7	30	-N		C	1454	70			
HUAN	04	1444		1502	N25	E66	.912	14888	9.6	18	-F	1	C					
MCMA	04	1457E		1515D	N26	E67	.919	14888	9.6	18D	-B		P	1457	30	.8	D	
349 ZURI	04	1528	1528	1530	N25	E68	.924	14888	9.7	2	-F		C	1528	40			Y5
350 MCMA	04	1558	1602	1609	N26	E67	.919	14888	9.7	11	-N		C	1602	20	.6	D	Y5
GRP64351	04	1823		1840	N25	E64	.898	14888	9.6	17	-F						E	
HUAN	04	1823		1837	N25	E64	.898	14888	9.6	14	-F	1	C					
MCMA	04	1825E		1843D	N25	E64	.898	14888	9.6	18D	-N		C	1832	40	1.0	E	
	04	1920	1929	NO FLARE PATROL														
	04	1942	1944	NO FLARE PATROL														
	04	1947	1959	NO FLARE PATROL														
352 PALE	04	2054	2055	2116	N27	E57	.848	14888	9.1	22	-N	3	C		45		DE	Y5

Hα SOLAR FLARES

AUGUST 1977

OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS	
	DATE AUG	START	MAX. PHASE	END	APPROX. LAT.	APPROX. MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMR DAY	MIN.		COND	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.		
GRP64353	04	2203	2210	2215	N25	E60	.869	14888	9.4	12	-F							
HUAN	04	2203		2213	N25	E62	.884	14888	9.6	10	-F	1	C					
PALE	04	2209E	2210	2216D	N26	E59	.862	14888	9.3	70	-F	3	C		32			
GRP64354	04	2225		2236D	N25	E60	.869	14888	9.4	11	-F				30	.6	D	
HUAN	04	2225		2232D	N25	E62	.884	14888	9.6	70	-F	1	P	2231	25		D	
PALE	04	2226E	2226U	2236D	N26	E59	.862	14888	9.4	100	-F	3	C		30			
	04	2308	2309	NO FLARE PATROL														
	05	0007	0016	NO FLARE PATROL														
	05	0017	0021	NO FLARE PATROL														
	05	0022	0023	NO FLARE PATROL														
	05	0151	0157	NO FLARE PATROL														
355 KANZ	05	0835	0858	0903	N25	E55	.827	14888	9.5	28	-F		C				LT	YS
GRP64356	05	1114>9	1134+3	1145	N26	E53	.812	14888	9.4	31	-N				30	.5	D	
KANZ	05	1114	1137	1145	N26	E51	.793	14888	9.3	31	-N		C					
CATA	05	1115	1135	1200	N27	E53	.814	14888	9.4	45	-B	2		1135	64	1.5	T	
ZURI	05	1134	1134	1146	N26	E54	.821	14888	9.5	12	-N		C	1134	30	.6		
MEUD	05	1134	1136	1142	N26	E54	.821	14888	9.5	8	-F		C	1136	30	.5	D	
RAMY	05	1140E	1142	1145D	N28	E51	.798	14888	9.3	50	-N	4	C		32			
KHAR	05	1140E	1140	1147D	N26	E54	.821	14888	9.5	70	-F		P				D	
GRP64357	05	1146+2	1147+2	1155	N26	E52	.803	14888	9.4	9	-F				40	.7	E	
MCMA	05	1146E	1147	1155D	N26	E53	.812	14888	9.5	90	-N		P	1147	40	.7	E	
MEUD	05	1148	1149	1155	N26	E50	.784	14888	9.2	7	-F		C	1149	40	.7	E	
ZURI	05	1148	1148	1154	N26	E54	.821	14888	9.5	6	-F		C	1148	30	.6		
KHAR	05	1153E		1153D	N27	E52	.805	14888	9.4		-F		P				D	
GRP64358	05	1234+0	1235+1	1239	N25	E54	.819	14888	9.6	5	-F				20	.4	D	
ZURI	05	1234	1236	1240	N26	E54	.821	14888	9.6	6	-F		C	1236	20	.4		
HUAN	05	1234	1235	1238	N24	E55	.826	14888	9.6	4	-F	1	C	1235	20	.3	D	
GRP64359	05	1330+1	1334+1	1338	N26	E53	.812	14888	9.5	8	-F						E	
ZURI	05	1330	1334	1338	N26	E54	.821	14888	9.6	8	-F		C	1334	30	.6		
KANZ	05	1331	1335	1342	N26	E51	.793	14888	9.4	11	-N		C				E	
HUAN	05	1331		1337	N26	E53	.812	14888	9.5	6	-F	1	C				E	
GRP64360	05	1404+9	1413+1 1420+0	1445	N26	E52	.803	14888	9.5	41	1N				180	3.1	EJ	
ZURI	05	1404	1414	1502	N26	E54	.821	14888	9.6	58	1N		C	1414	140	2.6		
HUAN	05	1405		1448	N25	E54	.819	14888	9.6	43	1F	1	C				E	
LVOV	05	1409	1413	1438	N26	E52	.803	14888	9.5	29	1N		C	1413	200	3.1	EJ	
MCMA	05	1410E		1436D	N26	E51	.793	14888	9.4	260	1B		C	1418	150	2.7	E	
KANZ	05	1412	1420	1433	N26	E50	.784	14888	9.3	21	1B		C					
MEUD	05	1413	1420	1440	N26	E52	.803	14888	9.5	27	1N		C	1420	250	4.2	F	
CATA	05	1415	1435	1515	N27	E51	.796	14888	9.4	60	1B	2		1435	140	2.4		
361 MCMA	05	1726E		1729D	N20	W22	.431	14880	4.1	30	-F		C	1726	30	.3	E	YS
GRP64362	05	1809+1	1811	1813	N25	E50	.782	14888	9.5	4	-F						D	
MCMA	05	1809E	1811	1813D	N26	E50	.784	14888	9.5	40	-N		C	1811	25	.4	D	
HUAN	05	1810		1813	N25	E50	.782	14888	9.5	3	-F	1	C					
	05	1823	1837	NO FLARE PATROL														
363 MCMA	05	1858	1910	1945D	N27	E48	.768	14888	9.4	470	1N		C	1910	125	2.1	E	YS
	05	1945	1948	NO FLARE PATROL														
	05	2008	2014	NO FLARE PATROL														
364 HUAN	05	2108		2117D	N25	E48	.762	14888	9.5	90	-F	1	P	2114	25	.4	D	YS
	05	2117	2121	NO FLARE PATROL														
365 HUAN	05	2147	2151	2155	N25	E48	.762	14888	9.5	8	-F	1	C	2151	20	.3	D	YS
366 VORO	05	2206	2209	2215	N27	E60	.871	14888	10.4	9	-F		C	2210	99	2.0	DJ	YS
367 VORO	05	2224	2226	2237	N27	E60	.871	14888	10.4	13	-F		C	2227	54	1.1	D	YS
	05	2307	2314	NO FLARE PATROL														
	06	0238	0246	NO FLARE PATROL														
	06	0255	0303	NO FLARE PATROL														
	06	0308	0313	NO FLARE PATROL														
	06	0314	0315	NO FLARE PATROL														

Hα SOLAR FLARES

AUGUST 1977

OBSERV-ATORY	OBSERVED UT				LOCATION					DURA-TION	IMPOR-TANCE	OBS.		MEASUREMENTS			REMARKS	
	DATE AUG	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMR DAY	MIN.		COND	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.		
368 PALE	06	0325E	0325U	0325D	N26	E43	.714	14888	9.4		-F	3	C		27			Y5
	06	0331	0334	NO FLARE PATROL														
369 HONT	06	0932	0934	0940	N26	E38	.660	14888	9.2	8	-F		C	0934	40		E	Y5
370 HONT	06	0946	0947	0953	N26	E38	.660	14888	9.3	.7	-F		C	0947	60		E	Y5
GRP64371	06	1042+7	1051+5	1133	N25	E40	.678	14888	9.4	51	1N						HOZ	
ATHN	06	1042	1051	1135	N25	E40	.678	14888	9.4	53	1N	1			196			
KANZ	06	1046	1054	1115	N24	E47	.749	14888	10.0	29	-F		C					
KHAR	06	1048E	1056	1150D	N25	E38	.656	14888	9.3	620	3N		P	1056	1110	15.0	EHOZ	
MEUD	06	1049		1130	N26	E40	.682	14888	9.5	41	1N		C	1103	230	3.2	F	
	06	1827	2201	NO FLARE PATROL														
	06	2327	2333	NO FLARE PATROL														
	07	0134	0145	NO FLARE PATROL														
GRP64372	07	1304	1310 1327+1	1339	N24	E24	.487	14888	9.3	35	-F				170	2.0		
KANZ	07	1304	1310	1332	N24	E24	.487	14888	9.3	28	-B		C					
TEHR	07	1322E	1327	1333D	N24	E25	.498	14888	9.4	110	-F	2	V		159			
TEHR	07	1322E	1327	1344	N24	E25	.498	14888	9.4	220	-F	2	C		159			
RAMY	07	1325E	1328	1345	N26	E24	.504	14888	9.4	200	-F	4	C		180			
	07	2327	2332	NO FLARE PATROL														
	07	2342	2353	NO FLARE PATROL														
GRP64373	08	1225+5	1229+1	1239D	N25	E13	.383	14888	9.5	14	-N							
KANZ	08	1225	1229	1239	N24	E15	.389	14888	9.6	14	-N		C					
CATA	08	1230	1230	1320	N26	E12	.388	14888	9.4	50	-N	2		1230	28	.3		
	08	1925	1928	NO FLARE PATROL														
	08	1932	2052	NO FLARE PATROL														
374 HUAN	08	2052E		2101D	S22	E54	.865	14893	12.9	90	-N	1	P					Y5
	08	2101	2112	NO FLARE PATROL														
	08	2202	2213	NO FLARE PATROL														
	08	2328	0013	NO FLARE PATROL														
	09	0141	0148	NO FLARE PATROL														
	09	0208	0212	NO FLARE PATROL														
375 CULG	09	0447	0450	0510	N23	E04	.295	14888	9.5	23	-F		C	0450	60	.6		Y5
GRP64376	09	0918+0	0920+3	0940	N24	E02	.306	14888	9.5	22	-F				100	1.1	E	
KHAR	09	0918E	0920	0932D	N24	E05	.315	14888	9.8	140	-F		P		110	1.2	E	
HTPR	09	0918	0923	0935	N23	E00	.287	14888	9.4	17	-F		C	0923	90	1.0		
MONT	09	0918	0921	0944	N25	E02	.322	14888	9.5	26	-N		C	0921	100		E	
GRP64377	09	1008+7	1013+2	1020	N26	E02	.339	14888	9.6	12	-N				40	.4	E	
MONT	09	1008	1013	1022	N26	E01	.337	14888	9.5	14	-F		C	1013	40		E	
HTPR	09	1011	1013	1017	N25	E02	.322	14888	9.6	6	-F		C	1013	50	.5		
CATA	09	1015	1015	1020	N26	E02	.339	14888	9.6	5	-B	2		1015	28	.3		
GRP64378	09	1031+0	1032+1	1044	N25	E01	.321	14888	9.5	13	-F				35	.4		
HTPR	09	1031	1033	1040	N25	E01	.321	14888	9.5	9	-F		C	1033	50	.5		
MONT	09	1031	1032	1047	N26	E01	.337	14888	9.5	16	-F		C	1032	20			
379 HUAN	09	1350	1353	1357	S22	E45	.792	14893	13.0	7	-F	1	C	1353	15	.2	D	Y5
GRP64380	09	1417+4	1422+3	1442	N26	00	.337	14888	9.6	25	-N				110	1.2		
HTPR	09	1417	1422	1445	N26	E02	.339	14888	9.7	28	-N		C	1422	130	1.4		
CATA	09	1420	1425	1445	N27	W01	.354	14888	9.5	25	-N	2		1425	112	1.2		
KANZ	09	1421	1425	1431	N25	W02	.322	14888	9.4	10	-N		C					
HUAN	09	1423E		1439	N27	E03	.357	14888	9.8	160	-F	2	P	1425	25	.3	CD	
HCMA	09	1431E		1441D	N27	E00	.353	14888	9.6	100	-N		P	1435	40	.4	F	
381 HUAN	09	1437		1447	S22	E45	.792	14893	13.0	10	-F	1	C				E	Y5
GRP64382	09	1538+1	1543+1	1554	N25	W01	.321	14888	9.6	16	-F							
HUAN	09	1538	1543	1557	N23	W02	.289	14888	9.5	19	-F	1	C	1543	30	.3		
HTPR	09	1539	1544	1550	N27	E00	.353	14888	9.7	11	-F		C	1544	140	1.5		
383 HUAN	09	1631		1639	N23	W04	.295	14888	9.4	8	-F	1	C					Y5

Hα SOLAR FLARES

AUGUST 1977

OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
					APPROX												
	DATE AUG	START	MAX. PHASE	END	LAT.	MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	MIN.		CONC	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR AREA Sq. Deg.	
GRP64384	09	1641	1644	1703	N27	00	.353	14888	9.7	22	-F						EH
HTPR	09	1641	1644	1655	N27	E00	.353	14888	9.7	14	-F		C	1644	90	1.0	H
MCMA	09	1650E		1710D	N27	W01	.354	14888	9.6	20D	-N		P	1653	40	.4	EH
385 MCMA	09	1704		1714D	S22	E43	.774	14893	12.9	10D	-N		P	1710	20	.2	E Y5
	09	1949	2004	NO FLARE PATROL													
	09	2018	2036	NO FLARE PATROL													
	09	2053	2058	NO FLARE PATROL													
	09	2106	2116	NO FLARE PATROL													
GRP64386	10	1731+0	1732+1	1745	N24	W16	.397	14888	9.5	14	-F				35	.4	E
MCMA	10	1731	1732	1745D	N23	W16	.386	14888	9.5	14D	-F		C	1732	20	.2	E
HTPR	10	1731	1733	1745	N25	W16	.409	14888	9.5	14	-N		C	1733	50	.5	
	10	2235	2241	NO FLARE PATROL													
387 VORO	10	2245	2248	2305	N24	W05	.314	14888	10.6	20	? N		C	2254	287	2.9	EJKL Y5
	IMP 1 NO } CULG1																
388 CATA	11	0710E	0740	0805D	S28	E73	.979	14897	16.8	55D	? F	2		0740	112		Y5
	IMP 1 NO } HTPR2																
389 HTPR	11	0746	0753	0810	N26	W23	.491	14888	9.6	24	-F		C	0753	40	.5	Y5
390 HUAN	11	1808	1811	1818	N28	E87	.995	14899	18.3	10	-F	2	C	1811	20		D Y5
	11	2304	2325	NO FLARE PATROL													
	11	2326	2333	NO FLARE PATROL													
	11	2340	2352	NO FLARE PATROL													
	11	2354	0010	NO FLARE PATROL													
	12	0045	0114	NO FLARE PATROL													
GRP64391	12	0715+1	0718+0	0726	N25	W37	.642	14888	9.5	11	-F				60	.8	E
HTPR	12	0715	0718	0725	N26	W36	.636	14888	9.6	10	-N		C	0718	60	.8	E
MONT	12	0716	0718	0726	N25	W38	.653	14888	9.5	10	-F		C	0718	60		E
392 HTPR	12	0813	0817	0825	N26	W37	.647	14888	9.6	12	-F		C	0817	60	.8	E Y5
GRP64393	12	1340+4	1350	1355	N28	E75	.960	14899	18.2	15	-F						
CATA	12	1340E	1350	1400	N28	E75	.960	14899	18.2	20D	-N	2		1350	56		
HUAN	12	1344		1350	N28	E76	.964	14899	18.3	6	-F	1	C				
GRP64394	13	1154+1	1154+1	1215	N28	W53	.814	14888	9.5	21	-F						E
KHAR	13	1154E	1154	1157D	N26	W55	.827	14888	9.4	3D	-F		P				E
CATA	13	1155	1155	1215	N31	W52	.813	14888	9.6	20	-N	2		1155	84	1.5	
	13	1830	1839	NO FLARE PATROL													
	13	1905	1911	NO FLARE PATROL													
	13	2032	2036	NO FLARE PATROL													
	13	2046	2054	NO FLARE PATROL													
	14	0206	0215	NO FLARE PATROL													
395 CATA	14	0945E	0945	1000D	N20	E18	.375	14894	15.8	15D	-N	2		0945	84	.9	Y5
396 HUAN	14	1401	1407	1415	N34	E70	.938	14904	19.8	14	-F	1	C	1407	20		D Y5
397 HUAN	14	1617		1620	N21	E65	.901	14903	19.6	3	-F	1	C				Y5
398 HUAN	14	1633	1635	1640	N35	E68	.929	14904	19.8	7	-F	1	C	1635	20		D Y5
399 HUAN	14	1850	1853	1854	N35	E68	.929	14904	19.9	4	-F	1	C	1853	25		D Y5
	14	1927	1928	NO FLARE PATROL													
	14	1932	2100	NO FLARE PATROL													
	15	0155	0201	NO FLARE PATROL													
400 CATA	15	0605E	0605	0620	N30	E40	.697	14899	18.3	15D	-N	2		0605	28	.4	Y5
401 MCMA	15	1339	1340	1350	N30	E32	.617	14899	18.0	11	-N		C	1340	30	.4	D Y5
GRP64402	15	1553+0	1554+1	1558	N30	E32	.617	14899	18.1	5	-N				30	.4	D
HUAN	15	1553	1555	1558	N30	E32	.617	14899	18.1	5	-N	1	C	1555	20	.2	D
MEUD	15	1553	1554	1558	N30	E31	.606	14899	18.0	5	-N		C	1554	40	.5	D
MCMA	15	1554E	1554	1557	N30	E32	.617	14899	18.1	3D	-B		C	1554	30	.4	D
	15	1922	1932	NO FLARE PATROL													

Hα SOLAR FLARES

AUGUST 1977

OBSERV-ATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS	
	DATE AUG	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMP. DAY	MIN.		CONF.	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR. AREA Sq. Deg.		
	15	2027	2035	NO FLARE PATROL														
	15	2048	2057	NO FLARE PATROL														
	15	2240	0102	NO FLARE PATROL														
	16	0109	0115	NO FLARE PATROL														
	16	0123	0140	NO FLARE PATROL														
	16	0145	0216	NO FLARE PATROL														
GRP64403	16	1405+2	1414+6	1422	N20	W09	.274	14894	15.9	17	-N				70	.7		
CATA	16	1405	1420	1445	N20	W09	.274	14894	15.9	40	-N	2		1420	56	.6		
HTPR	16	1407	1414	14220	N21	W09	.288	14894	15.9	150	-F		C	1414	75	.8		
KANZ	16	1410E	1418	1421	N20	W08	.266	14894	16.0	110	-N		C					
GRP64404	17	0732	0733	0744	N32	E14	.476	14899	18.4	12	-F						D	
MONT	17	0732	0733	0743	N33	E15	.496	14899	18.4	11	-F		C	0733	20		D	
BUCA	17	0736E		07450	N31	E14	.463	14899	18.4	90	-F		P	0736	64	.8		
405 MONT	17	1002	1004	1007	N33	E15	.496	14899	18.5	5	-F		C	1004	40		E	Y5
406 HTPR	17	1226E		12270	N28	E10	.395	14899	18.3	10	-F		C	1227	100	1.1		Y5
407 HCMA	17	1511	1513	1520	N22	W20	.417	14894	16.1	9	-F		C	1513	20	.2	D	Y5
408 HCMA	17	1815E	1816	1843	N26	E07	.349	14899	18.3	280	-N		C	1816	45	.5	E	Y5
	17	1943	2002	NO FLARE PATROL														
	17	2038	2055	NO FLARE PATROL														
	17	2102	2118	NO FLARE PATROL														
	17	2125	2130	NO FLARE PATROL														
	18	1926	1928	NO FLARE PATROL														
409 VORO	18	2306	2308	2317	N18	W42	.675	14894	15.8	11	?N		C	2311	152	2.1	EJ	Y5
	IMP/1 NO 9 CULG1																	
410 VORO	19	0031	0032	0038	N19	W42	.677	14894	15.9	7	-F		C	0032	81	1.1	EJ	Y5
GRP64411	19	1305E	1320	14000	N30	W15	.456	14899	18.4	55	1N				200	2.3	EU	
HCMA	19	1305E		1400D	N29	W18	.469	14899	18.2	550	-N		C	1320	125	1.3	EFU	
CATA	19	1310E	1320	1330D	N31	W15	.469	14899	18.4	200	1B	2		1320	196	2.3		
HTPR	19	1320E		1344D	N29	W13	.428	14899	18.6	240	1N		C	1320	400	4.4	E	
	20	0045	0053	NO FLARE PATROL														
412 MONT	20	0751	0756	0800	N18	W60	.861	14894	15.8	9	-F		C	0756	40		E	Y5
413 CATA	20	1340	1355	14550	N17	W64	.892	14894	15.8	750	-N	2		1355	56	1.3		Y5
GRP64414	20	1500>9	1515+2	15250	N21	W65	.901	14894	15.7	25	-N				50			
CATA	20	1500E	1515	1600D	N20	W64	.893	14894	15.8	600	-B	2		1600	56	1.3	D	
HUAN	20	1513	1517	1525	N22	W66	.908	14894	15.7	12	-F	1	C	1517	45	1.0	ET	
415 HUAN	20	1602	1610	1622	N22	W65	.901	14894	15.8	20	-N	1	C	1610	20			Y5
416 HUAN	20	1645		1656	N22	W66	.908	14894	15.7	11	-F	1	C				E	Y5
417 HUAN	20	1722	1724	1728	N22	W66	.908	14894	15.9	6	-F	1	C	1724	60		E	Y5
GRP64418	20	1738+3	1743+0	1748	N20	W65	.900	14894	15.9	10	-F				80		F	
HUAN	20	1738	1743	1749	N22	W66	.908	14894	15.8	11	-N	1	C	1743	80			
PALE	20	1741	1743	1746	N19	W65	.900	14894	15.9	5	-F	3	V		88		F	
419 PALE	20	1950	1951	1952	N19	W65	.900	14894	16.0	2	-F	3	V		23		DE	Y5
	20	2022	2024	NO FLARE PATROL														
	20	2027	2030	NO FLARE PATROL														
	21	0132	0134	NO FLARE PATROL														
	21	1550	1617	NO FLARE PATROL														
420 CATA	22	1205	1205	1215	N20	W90	.999	14894	15.9	10	-F	2		1205	28			Y5
421 HUAN	22	1650	1655	1659	N20	W90	.999	14894	16.0	9	-F	1	C	1655	40			Y5
	22	2037	2044	NO FLARE PATROL														
422 HCMA	22	2056		20580	N28	W63	.891	14899	18.1	20	-N		P	2058	25	.6	E	Y5
	22	2113	2120	NO FLARE PATROL														

Hα SOLAR FLARES

AUGUST 1977

OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS
	DATE AUG	START	MAX. PHASE	END	APPROX LAT.	APPROX MER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMR DAY	MIN.		CONF.	TYPE	TIME UT	MEAS. AREA Millionths of Disk	CORR AREA Sq. Deg.	
423 VORO	22	2257	2320	0014	N31	W64	.900	14899	18.2	77	?F		C	2409	474	10.0	EGJK Y5
	IMF.2 NO I PALE2			CULG1													
GRP64424	23	0655	0700+5	0724	S21	W63	.926	14902	18.6	29	-N				80		
CATA	23	0655	0700	0725	S21	W63	.926	14902	18.6	30	1N	2		0700	112		
ATHN	23	0659E	0705	0722	S21	W63	.926	14902	18.6	230	-F	1			49		
425 HTPR	23	1508		1512D	N22	W37	.625	14908	20.9	40	-F		C	1509	60	.8	D Y5
426 HUAN	23	1525		1541	S17	E22	.535		25.3	16	-F	1	C				D Y5
GRP64427	23	2100+0	2102+0	2108	S25	E41	.778	14915	26.9	8	-F				50	.8	
PALE	23	2100	2102	2108	S25	E41	.778	14915	27.0	8	-F	3	C		48		DE
PALE	23	2100	2102	2108	S25	E41	.778	14915	27.0	8	-F	3	V		48		DE
	23	2101	2117	NO FLARE PATROL													
GRP64428	23	2117+0	2120+0	2123	S25	E41	.778	14915	27.0	6	-F				30	.5	
PALE	23	2117	2120	2123	S25	E41	.778	14915	27.0	6	-F	3	C		31		DE
PALE	23	2117	2120	2123	S25	E41	.778	14915	27.0	6	-F	3	V		31		DE
	23	2127	2130	NO FLARE PATROL													
GRP64429	23	2147+0	2149+0	2156	S25	E41	.778	14915	27.0	9	-F				30	.5	
PALE	23	2147	2149	2156	S25	E41	.778	14915	27.0	9	-F	3	V		25		DE
PALE	23	2147	2149	2156	S25	E41	.778	14915	27.0	9	-F	3	C		25		DE
	23	2227	2235	NO FLARE PATROL													
GRP64430	24	0155+0	0155+1	0202	S25	E38	.754	14915	26.9	7	-F				50	.7	D
VORO	24	0155	0156	0204	S25	E37	.745	14915	26.9	9	-F		C	0157	72	1.3	D
PALE	24	0155	0155	0159	S25	E39	.762	14915	27.0	4	-F	3	C		29		
431 CULG	24	0234	0250	0330	N23	W43	.698	14908	20.9	56	-F		C	0250	80	1.3	Y5
GRP64432	24	0547	0600	0620	S26	E34	.727	14915	26.8	33	1N						E
HTPR	24	0547	0600	0610	S26	E34	.727	14915	26.8	23	1N		C	0600	300	4.2	E
CATA	24	0605E	0605	0630D	S27	E34	.735	14915	26.8	250	-B	2		0605	112	1.7	T
GRP64433	24	0554+1	0606	0635	S23	W87	1.000	14902	17.7	41	-N						A
CULG	24	0527	0532	0620D	S23	W85	.999	14902	17.9	530	-N	*	C	0532	40		
CULG	24	0554	0606U	0621D	S24	W85	1.000	14902	17.9	270	-N	*	P	0606	40		
HTPR	24	0555		0635	S22	W90	1.001	14902	17.5	40	-N	*	C				A
GRP64434	24	1204+0	1206+4	1236	N24	W50	.775	14903	20.8	32	-N				30	.5	E
HTPR	24	1204	1210	1230	N23	W50	.773	14903	20.8	26	-F		C	1210	40	.6	
MCMA	24	1204		1207D	N24	W50	.775	14903	20.8	30	-N		P	1206	30	.5	E
ZURI	24	1204	1206	1242	N24	W49	.765	14903	20.8	38	-B		P	1206	20	.3	
435 MCMA	24	1326	1327	1334	N21	W36	.609	14920	21.9	8	-N		C	1327	25	.3	D Y5
436 ZURI	24	1418	1418	1422D	S26	E32	.711	14915	27.0	40	-N		P	1418	30	.5	Y5
437 HUAN	24	1556		1604	S21	W90	1.001	14902	17.9	8	-F	1	C				Y5
	24	1824	1827	NO FLARE PATROL													
	24	2004	2007	NO FLARE PATROL													
	24	2043	2055	NO FLARE PATROL													
	24	2058	2108	NO FLARE PATROL													
	24	2112	2122	NO FLARE PATROL													
	24	2230	2240	NO FLARE PATROL													
	25	0133	0140	NO FLARE PATROL													
	25	0212	0215	NO FLARE PATROL													
438 HTPR	25	0551	0555	0615	N22	W45	.718	14920	21.9	24	-F		C	0555	70	1.0	D Y5
439 HTPR	25	0639	0646	0715	N22	W46	.728	14920	21.8	36	-N		C	0646	140	1.9	E Y5
GRP64440	25	0810+5	0821 0829	0837	N21	W46	.726	14920	21.9	27	-F						
KANZ	25	0810	0829	0835	N21	W47	.737	14920	21.8	25	-F		C				
ZURI	25	0815	0821	0839	N21	W46	.726	14920	21.9	24	-N		C	0821	30	.5	
GRP64441	25	0915	0915	0925	S26	E15	.589	14915	26.5	10	-N						
CATA	25	0915	0915	0925	S26	E15	.589	14915	26.5	10	-N	2		0915	112	1.4	
KANZ	25	0920E	0920	0920D	S26	E15	.589	14915	26.5		-F		C				

Hα SOLAR FLARES

AUGUST 1977

OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS.		MEASUREMENTS			REMARKS	
	DATE AUG	START	MAX. PHASE	END	APPROX LAT.	APPROX HER. DIST.	CENTRAL DISTANCE	McMATH PLAGE REGION	CMR DAY	MIN.		CONC.	TYPE	TIME UT	MEAS. AREA Millionths of Disk	CORR. AREA Sq. Deg.		
GRP64442	25	1002+3	1003+2	1014	S27	E18	.619	14915	26.8	12	-N		C		30	.4	D	
HTPR	25	1002	1003	1014	S27	E18	.619	14915	26.8	12	-N		C	1003	50	.6	D	
ZURI	25	1003	1003	1009	S27	E19	.625	14915	26.8	6	-N		C	1003	16	.2		
KHAR	25	1005E	1005	1012D	S27	E20	.631	14915	26.9	70	-F		C				D	
CATA	25	1005	1005	1015	S27	E18	.619	14915	26.8	10	-N	2		1005	28	.4		
CATA	25	1005	1005	1035	S27	E18	.619	14915	26.8	30	-N	2		1005	28	.4		
KANZ	25	1005	1005	1005D	S26	E15	.589	14915	26.5		-N		C					
KANZ	25	1017	1017	1017D	S27	E15	.602	14915	26.6		-N		C					
GRP64443	25	1025+0	1031+6	1056	S28	E15	.614	14915	26.6	31	-N						E	
ZURI	25	1025	1037	1057	S28	E16	.620	14915	26.6	32	-F		C	1037	14	.2		
HTPR	25	1025	1031	1100	S28	E16	.620	14915	26.6	35	-N		C	1031	80	1.1	E	
CATA	25	1035	1035	1055	S29	E14	.622	14915	26.5	20	-N	2		1035	28	.4		
KANZ	25	1036	1036	1055	S28	E15	.614	14915	26.6	19	-N		C					
GRP64444	25	1043+6	1049+5	1059	N21	W47	.737	14920	21.9	16	-F							
ZURI	25	1043	1049	1053	N21	W46	.726	14920	22.0	10	-N		C	1049	60	.9		
KANZ	25	1049	1054	1104	N21	W48	.748	14920	21.9	15	-F		C					
GRP64445	25	1435+0	1441+0	1452	N25	W64	.895	14908	20.8	17	-F				30		D	
ZURI	25	1435	1441	1459	N25	W65	.902	14908	20.7	24	-F		C	1441	40	1.0		
HUAN	25	1435	1441	1445	N26	W64	.896	14908	20.8	10	-F	1	C	1441	15		D	
GRP64446	25	1554+1	1557	1608	S27	E18	.619	14915	27.0	14	-F						DH	
MCMA	25	1554	1557	1615	S28	E18	.631	14915	27.0	21	-N		C	1557	25	.3	DH	
HUAN	25	1555		1601	S27	E18	.619	14915	27.0	6	-F	1	C					
447 MCMA	25	1626	1628	1631	S28	E18	.631	14915	27.0	5	-N		C	1628	25	.3	DH	Y5
448 MCMA	25	1839E		1840D	S28	E17	.625	14915	27.1	10	-F		P	1839	20	.2	D	Y5
	25	1840	1849	NO FLARE PATROL														
	25	1857	1915	NO FLARE PATROL														
	25	1932	1941	NO FLARE PATROL														
	25	1942	1947	NO FLARE PATROL														
	25	2001	2040	NO FLARE PATROL														
	25	2042	0050	NO FLARE PATROL														
	26	0203	0205	NO FLARE PATROL														
449 MANI	26	0542E	0545	0549	S25	E06	.539	14915	26.7	70	-N	2	P	0545	80	1.0		Y5
GRP64450	26	0630+3	0635+0	0640	S27	E09	.576	14915	26.9	10	-N				80	1.0	DH	
CATA	26	0630	0635	0640D	S27	E09	.576	14915	26.9	100	-N	2		0635	56	.7		
MANI	26	0633	0635	0639	S25	E06	.539	14915	26.7	6	-N	2	P	0635	90	1.1	H	
HTPR	26	0635E		0640	S28	E12	.601	14915	27.2	50	-N		C	0635	100	1.2	DH	
451 MCMA	26	1312E		1415	S27	E06	.567	14915	27.0	630	-F		C	1321	40	.4	EHK	Y5
452 HUAN	26	1451		1454	S27	E07	.570	14915	27.1	3	-F	1	C					Y5
GRP64453	26	1645+1	1646	1650	S27	E06	.567	14915	27.1	5	-F						D	
MCMA	26	1645	1646	1649	S28	E06	.581	14915	27.1	4	-N		C	1646	25	.3	D	
HUAN	26	1646		1650	S27	E06	.567	14915	27.1	4	-F	1	C					
GRP64454	26	1704+0		1708	S27	E04	.563	14915	27.0	4	-F						D	
MCMA	26	1704E		1709	S28	E03	.576	14915	26.9	50	-N		C	1704	25	.3	D	
HUAN	26	1704		1706	S27	E05	.565	14915	27.1	2	-F	1	C					
455 MCMA	26	1806	1811	1820	S26	E04	.549	14915	27.1	14	-N		C	1811	35	.4	E	Y5
GRP64456	26	1952+1	1954	2004	S25	E03	.533	14915	27.1	12	-N						E	
MCMA	26	1952	1954	2004	S26	E03	.547	14915	27.1	12	-N		C	1954	60	.7	E	
HUAN	26	1953		1953D	S25	E03	.533	14915	27.1		-F	1	P					
GRP64457	26	2134	2138+0	2148	S26	W02	.546	14915	26.7	14	-N						EJ	
VORO	26	2134	2138	2148	S28	W04	.577	14915	26.6	14	1N		C	2140	161	2.1	EJ	
PALE	26	2136E	2138	2139D	S25	W01	.531	14915	26.8	30	-F		C	2138	3			
458 VORO	26	2210	2212	2215	S31	E55	.905	14924	31.0	5	-F		C	2212	54	1.1	OG	Y5
459 VORO	26	2310	2313	2319	S32	E55	.909	14924	31.1	9	-N		C	2313	63	1.5	OG	Y5
460 CATA	27	0955	1000	1015	N27	W28	.548	14922	25.3	20	-N	2		1000	28	.3		Y5
GRP64461	27	1102+3	1105+1	1125	S26	W10	.566	14915	26.7	23	-B						E	
KHAR	27	1102E	1106	1121D	S27	W11	.584	14915	26.6	190	-N		C	1106	110	1.4	E	
CATA	27	1105	1105	1125	S26	W10	.566	14915	26.7	20	1B	2		1105	337	4.2		

Hα SOLAR FLARES

AUGUST 1977

OBSERVATORY	OBSERVED UT				LOCATION					DURATION	IMPORTANCE	OBS		MEASUREMENTS			REMARKS	
	DATE AUG	START	MAX. PHASE	END	APPROX. LAT.	APPROX. MER. DIST.	CENTRAL DISTANCE	HeMATH PLAGE REGION	CMP DAY	MIN.		CONF	TYPE	TIME UT	MEAS. AREA Mill. of Disk	CORR. AREA Sq. Deg.		
	27	2035	2039	NO FLARE PATROL														
	27	2044	2110	NO FLARE PATROL														
	28	0950	1000	NO FLARE PATROL														
	28	1817	1821	NO FLARE PATROL														
462 HUAN	28	1849		1854	S20	E87	1.000	14929	4.3	5	-F	1	C	1851	25		D	Y5
	28	1901	1906	NO FLARE PATROL														
	28	1909	1913	NO FLARE PATROL														
	28	1917	1921	NO FLARE PATROL														
463 HUAN	28	1923		1929	S20	E87	1.000	14929	4.3	6	-F	1	C	1923	30			Y5
	28	1953	2005	NO FLARE PATROL														
	28	2036	2124	NO FLARE PATROL														
	29	0143	0148	NO FLARE PATROL														
	29	0158	0224	NO FLARE PATROL														
	29	0249	0300	NO FLARE PATROL														
	29	0516	0532	NO FLARE PATROL														
	29	0538	0545	NO FLARE PATROL														
464 CATA	29	0735	0740	0740D	S24	W35	.722	14915	26.7	5D	-B	2		0740	73	1.1		Y5
465 HUAN	29	1453		1503	S24	W48	.765	14915	26.6	10	-F	1	C					Y5
	29	1740	1744	NO FLARE PATROL														
	29	1910	2048	NO FLARE PATROL														
466 VORO	29	2135E		2149D	S27	W48	.784	14915	26.9	14D	-N		C	2136	81	1.3	DJ	Y5
	29	2315	2325	NO FLARE PATROL														
	29	2333	2338	NO FLARE PATROL														
	30	0520	0526	NO FLARE PATROL														
	30	0546	0600	NO FLARE PATROL														
467 CATA	30	0750E	0755	0830D	S27	W38	.768	14915	27.5	40D	-N	2		0755	56	.9		Y5
	30	0928	0930	NO FLARE PATROL														
	30	0936	0945	NO FLARE PATROL														
GRP64468	30	1339>9	1441	1450	N24	E90	.999	14930	7.3	71	1F						A	
KANZ	30	1339	1441	1450	N25	E90	.999	14930	6.3	71	1F		C				A	
CATA	30	1435	1440	1440D	N24	E90	.999	14930	6.4	5D	1F	2		1440	56			
	30	1543	1548	NO FLARE PATROL														
469 HCMA	30	1730E	1733	1740D	N25	E90	.999	14930	6.5	10D	-F		C	1733				Y5
	30	1740	1748	NO FLARE PATROL														
	30	1845	1853	NO FLARE PATROL														
	30	1859	2230	NO FLARE PATROL														
470 CATA	31	0820	0830	0830D	N24	E90	.999	14930	7.1	10D	-F	2		0830	28			Y5
GRP64471	31	0941	0946+1	0953D	N22	E82	.985	14930	7.6	12	-F						D	
MONT	31	0941	0946	0950D	N22	E83	.987	14930	6.6	9D	-F		C	0946	20		D	
KHAR	31	0943E	0947	0953D	N23	E81	.981	14930	6.5	10D	-F		C				D	
GRP64472	31	1004+6	1015+1	1105D	N26	E80	.978	14930	7.4	61	2N						AEHO	
HTPR	31	1004	1010	1014D	N25	E80	.978	14930	6.4	10D	1N	*	C				AE	
KHAR	31	1005	1016	1140D	N27	E80	.978	14930	6.4	95D	2N	*	C	1035	440		HO	
CATA	31	1010	1015	1105	N27	E85	.991	14930	6.8	55	3B	*		1015	393			
ATHN	31	1012E	1015	1040D	N22	E78	.971	14930	6.3	28D	1N	*						
ZURI	31	1013E	1016	1058D	N26	E81	.981	14930	6.5	45D	1B	*	P	1016	100			
	31	2030	2221	NO FLARE PATROL														

"Remarks":

A = Eruptive prominence whose base is less than 90° from central meridian.
B = Probably the end of a more important flare.
C = Invisible 10 minutes before.
D = Brilliant point.
E = Two or more brilliant points.
F = Several eruptive centers.
G = No visible spots in the neighborhood.
H = Flare accompanied by a high speed dark filament.
I = Active region very extended.
J = Distinct variations of plage intensity before or after the flare.
K = Several intensity maxima.
L = Existing filaments show signs of sudden activity.
M = White-light flare.
N = Continuous spectrum shows effects of polarization.
O = Observations have been made in the calcium II lines H and K.
P = Flare shows helium D_3 in emission.
Q = Flare shows the Balmer continuum in emission.
R = Marked asymmetry in Hα line suggests ejection of high velocity material.
S = Brightness follows disappearance of filament (same position).
T = Region active all day.
U = Two bright branches, parallel (||) or converging (Y).
V = Occurrence of an explosive phase: important and abrupt expansion in about a minute with or without important intensity increase.
W = Great increase in area after time of maximum intensity.
X = Unusually wide Hα line.
Y = System of loop-type prominences.
Z = Major sunspot umbra covered by flare.

DAILY FLARE INDICES
Includes all Flares

AUGUST 1977

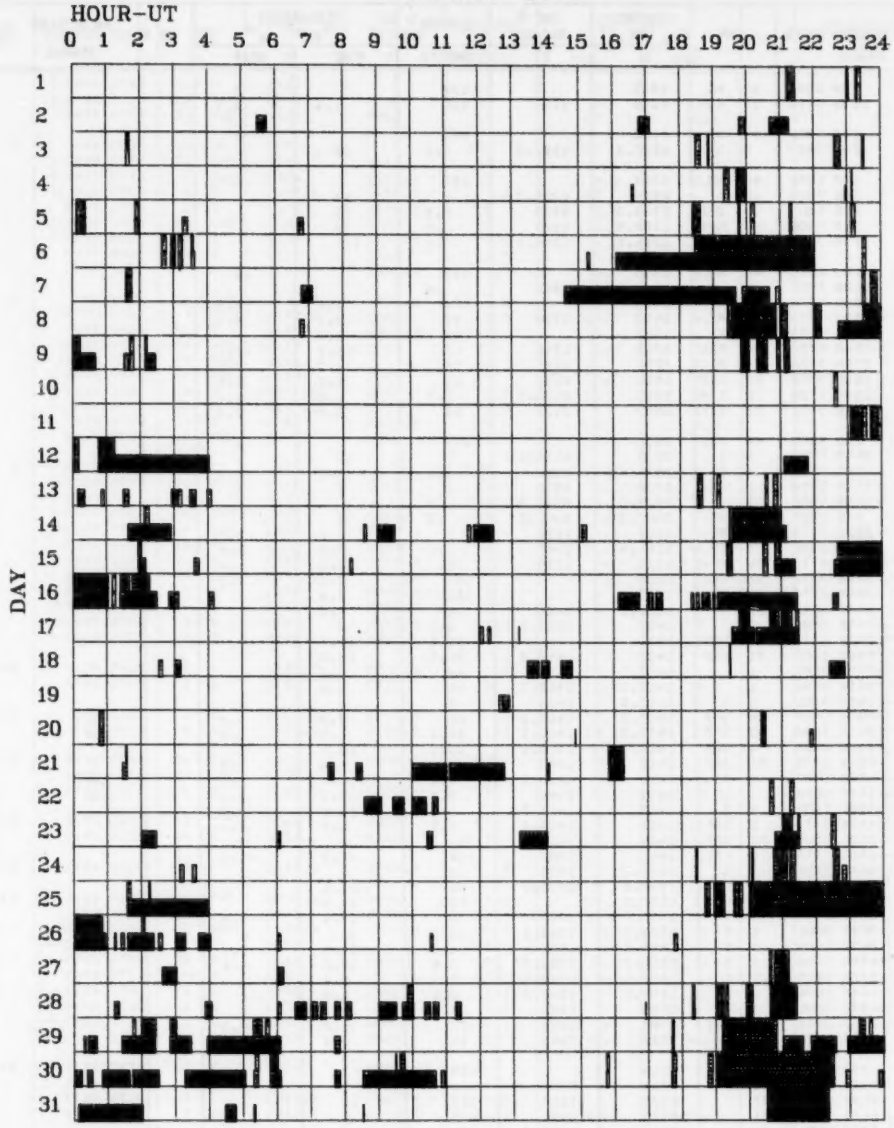
Date	Flare Index	HR. OBS.	Date	Flare Index	HR. OBS.	Date	Flare Index	HR. OBS.
770801	7.45	23.6	770811	4.22	23.1	770821	0.00	23.5
770802	5.28	24.0	770812	6.20	23.5	770822	2.53	23.8
770803	8.03	23.5	770813	1.90	23.6	770823	12.40	23.6
770804	9.61	23.6	770814	9.12	22.4	770824	21.01	23.2
770805	45.44	23.1	770815	6.33	21.1	770825	31.44	18.4
770806	18.09	19.9	770816	2.61	23.1	770826	32.09	24.0
770807	15.25	23.6	770817	23.45	23.1	770827	6.78	23.5
770808	6.56	21.5	770818	0.00	24.0	770828	1.76	22.6
770809	39.97	23.0	770819	23.01	24.0	770829	6.30	21.0
770810	.65	23.9	770820	9.76	23.8	770830	6.78	19.6
						770831	72.61	22.2

When no Flare Index is given, it is 0 for that day.

INTERVALS OF NO FLARE PATROL OBSERVATION

FOR PRECEDING SOLAR FLARE TABLE

AUGUST 1977



Observatories included in total patrol:

Athenes	Herstmonceux	Kiev	McMath-Hulbert	Tashkent
Bucharest	Huancayo	Kodaikanal	Meudon	Tehran
Catania	Kandilli	Locarno	Mitaka	Upice
Culgoora	Kanzelhohe	Lvov	Monte Mario	Voroshilov
Haute Provence	Kharkov	Manila	Palehua	Wendelstein
			Ramey	Zürich

Times of no flare patrol are shown by the shaded area for each day divided into times of no cinematographic patrol (bottom half of day) and times of neither visual nor cinematographic patrol (top half of day).

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

AUGUST 1977

AUG 1977	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} MEAN	INT	POLARIZATION OR REMARKS
1	100	GORK	44 NS	0300		120		5		
	2800	OTTA	20 GRF	1455	1620	255	1.4	0.7		
2	100	GORK	43 NS	0333		420		5		
	260	ONDR	8 S	1507.3	1507.3	.3	25			
3	100	GORK	43 NS	0303		297		5		
	260	ONDR	45 C	0925	0925.7	2	13			
	608	ONDR	4 S/F	0929.3	0930	1.5	55			
	260	ONDR	4 S/F	1124.5	1125	.6	30			
	260	ONDR	8 S	1204.8	1204.8	.3	121			
4	100	GORK	44 NS	0345		453		10		
	1420	ARCE	1	1001.9	1002	.6				
	2800	OTTA	27 RF	1450		170	1.2	0.9		
	2800	OTTA	24 R	1450	1530	40	1.2	0.8		
	2800	OTTA	24P R	1530		90	1.2			
	2800	OTTA	26 FAL	1700	1740	40	-1.2	-0.6		
	2800	OTTA	240 R	1755	1805	10	1.2	0.6		
	2800	OTTA	20 GRF	1825	1835	60	1.2	0.6		
	2800	OTTA	2 S/F	2054	2054.5	1.5	1.6	0.8		
	2800	OTTA	22 GRF	2056	2125	80	3.8	2.1		
5	100	GORK	44 NS	0306		459		5		
	9400	TYKW	5 S	0535	0535.4	5	10	3		OL
	4995	ATHN	3 S	0934.4	0940	1.1	8.3	2.5		
	3100	CRIM	1 S	0938	0939	2	3	1		
	1420	ARCE	1	0939.6	0939.9	.8				
	536	ONDR	3 S	0947.2	0947.2	.3	21			
	2800	OTTA	240 R	1127	1136	9	1.4	0.7		
	7000	SAOP	8 SP	1146.4	1147	1.2	5.2	3.5		
	2800	OTTA	24 R	1230	1300	30	2.8	1.4		
	2800	OTTA	27AFRF	1230		295	2.8	2.2		
	2800	OTTA	24P R	1300		165	2.8			
	1470	BERL	21	1411.5	1424	49	1.5			
	1470	BERL	2	1412	1413.5	3.5	3			
	7000	SAOP	20 GRF	1412		51.6	12.3			
	7000	SAOP	21 GRF	1412	1413.3	51.6	21.5			
	3000	BERL	1	1412.3	1413	48	9.7			
	9500	BERL	1	1412.5	1412.9	48	8.4			
	1420	BOUL	1 S	1412.5	1413	3	3	1		
	4995	SGMR	20 GRF	1412.8	1413.3	22	13.5	4.1		SWF
	2695	SGMR	20 GRF	1412.9	1413.5	22.5	7.5	2.3		SWF
	4995	ATHN	3 S/F	1412.9	1413.4	36.5	16.6	5		
	2800	OTTA	21 GRF	1412	1423	78	4.6	2.3		
	8800	SGMR	3 S	1413	1413.3	9.2	10.4	3.1		SWF
	1415	SGMR	1 S	1413	1414	2.7	5.5	1.6		SWF
	7000	SAOP	3 S	1413	1413.3	2.2	16.5	5.7		
	2800	OTTA	2 S/F	1413	1413.2	4.5	6.8	3.1		
	2695	BOUL	23 GRF	1414	1414.5	15	6	3		
	2800	OTTA	26 FAL	1545	1725	100	-2.8	-1.4		
	1420	BOUL	1 S	1857.5	1900	12	5	2		
	7000	SAOP	21 GRF	1857.8	1900.4	55	17.1			
	7000	SAOP	20 GRF	1857.8		55	10.5			
	2800	OTTA	3 S	1857	1900	6	20.4	5.1		
	2695	BOUL	1 S	1858.5	1900.1	11.5	18	6		
	2695	SGMR	3 S	1858.6	1900.1	4.3	24.8	7.4		
	4995	SGMR	3 S	1859.2	1900.2	2.8	13.6	4.1		
	7000	SAOP	1 S	1859.4	1900.4	2.4	8.8	3		
	1415	SGMR	1 S	1859.5	1900.3	2.8	6.7	2		
	4995	BOUL	1 S	1859	1900	3.5	15	5		
	2800	OTTA	29 PBI	1903	1903	77	4.2	2.3		
	2800	OTTA	240 R	2030	2045	15	0.8	0.4		
6	100	GORK	44 NS	0315		450		5		
	3100	CRIM	40 F	0744	0950	133	2	1		
	9500	BERL	20	0933	1117	182	11			
	1470	BERL	21	0935	1051	200	5			
	3000	BERL	20	0941	1050.5	174	14			
	3100	CRIM	3 S	0957	1152 U	93 D	14			
	260	ONDR	42 SER	1032	1048	30	9	1.4		
	408	TRST	41 F	1042.6	1049.6	9.1	4			
	536	ONDR	45 C	1045	1051.3	7	62	4.4		
	1420	ARCE	22	1047.5	1051.2	72				
	237	TRST	5 S	1049.2	1049.3	.1	87	30		0
	808	ONDR	45 C	1050.3	1051.5	2	170	65		
	686	SGMR	3 S	1050.8	1051.8	1.6	223.2	67		
	2800	OTTA	26 FAL	1100	1307	127	-9.6	-6		
	7000	SAOP	1 S	1348.7	1349.4	2.6	3.6	2.4		
	2800	OTTA	32 ABS	1535	1555	68	-4.2	-2.1		
	4995	BOUL	3 S	1743	1744.5	2	12	4		
	2695	BOUL	3 S	1744.5	1745.5	2.5	2	1		
	2800	OTTA	27AFRF	2033		197	3	2.2		
	2800	OTTA	24 R	2033	2145	72	3	1.5		

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

AUGUST 1977

AUG 1977	FREQUENCY	STATION	TYPE		STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} MEAN	INT	POLARIZATION OR REMARKS
6	2800	OTTA	24P	R	2145		108	3			
	2800	OTTA	20	GRF	2249	2251	30	2	1		
	2800	OTTA	26	FAL	2333	2350	17	-3	-1.5		
7	260	ONDR	43	NS	1204		194	15			
	2800	OTTA	21	GRF	1300	1315	110	4.6	2.3		
	2800	OTTA	2	S/F	1304	1305.1	8	4.4	2.2		
	536	ONDR	8	S	1445.8	1445.8	.3	80			
	2800	OTTA	1	S	1633	1635.2	10	1.2	0.4		
	2800	OTTA	20	GRF	1705	1730	45	0.8	0.4		
	2695	BOUL	3	S	1744	1745.5	2.5	3	1		
	4995	BOUL	3	S	1843	1844.5	2.5	10	3		
	7000	SAOP	1	S	1905.1	1905.8	1.2	6.4	4.3		
8	208	VORO	4	S/F	0004.6	0005.2	1.5	22			
	4995	ATHN	3	S/F	0407.6	0408	1.9	15.5	4.7		
	260	ONDR	41	F	1120	1311.6	140	5			
	2800	OTTA	20	GRF	2015	2023	30	1.8	0.9		
	2800	OTTA	20	GRF	2105		40	1	0.7		
	2800	OTTA	21	GRF	2150	2210	35	1.2	0.6		
	4995	BOUL	8	S	2206.5	2207.5	1.5	12	4		
	2695	BOUL	8	S	2207.5	2208	1.5	4	1		
	2800	OTTA	1	S	2207	2207.5	2	3	1.2		
	2695	PENT	22	GRF	2252	2254	24	1.4	0.7		
9	2800	OTTA	27A	RF	1415		175	1.2	1.1		
	2800	OTTA	24	R	1415	1425	10	1.2	0.6		
	2800	OTTA	24P	R	1425		153	1.2			
	2800	OTTA	20	GRF	1535	1541	23	1.6	0.8		
	2800	OTTA	20	GRF	1625	1631	15	1.4	0.7		
	2800	OTTA	26	FAL	1658	1710	12	-1.2	-0.6		
	2800	OTTA	1	S	2245	2246.9	2.5	6.6	3.3		
	2800	OTTA	29	PBI	2247.5	2247.5	37	2.4	1.2		
	2000	TYKW	5	S	2245	2246.8	5	4	1.5		OR
	3750	TYKW	5	S	2246	2246.7	2	5	2		OL
	2695	BOUL	3	S	2246	2247.5	2.5	6	2		
	1420	BOUL	3	S	2246	2246.5	2	3	1		
10	536	ONDR	8	S	1232.5	1232.5	.5	78			
	2800	OTTA	1	S	1730	1731	8	1.4	0.5		
11	536	ONDR	8	S	1219.3	1219.3	.3	72			
	536	ONDR	8	S	1409.5	1409.5	.3	38			
12	3100	CRIM	26	FAL	0857	1200	183	9			
	2800	OTTA	20	GRF	1520	1550	60	1.2	0.6		
	2800	OTTA	1	S	1728.5	1729	3	0.8	0.4		
13	3100	CRIM	20	CRF	0614	0625	47	4	1		
	3100	CRIM	24	R	0710	0915	125	5			
14	1420	ARCE	8		0807.3	0807.5	.5				
15	9100	GORK	20	GRF	0834.1	0835	1.1	10	5		
	260	ONDR	4	S/F	0920	0920	1	43	14		
	9100	GORK	20	GRF	1122.8	1123.8	37.2	5.3	1.8		
	2800	OTTA	27A	RF	1430		100	0.8	0.7		
	2800	OTTA	24	R	1430	1455	25	0.8	0.4		
	2800	OTTA	24P	R	1455		65	0.8			
	1420	BOUL	1	S	1551	1552	1.5	2	1		
	2695	BOUL	1	S	1552.5	1553.5	1.5	3	1		
	2800	OTTA	1	S	1552	1552.5	2	2.2	1		
	2800	OTTA	26	FAL	1600	1610	10	-0.8	-0.4		
16	3100	CRIM	41	F	0823	0950	32	3	1		
	3100	CRIM	5	S	0950	0952	8	3	1		
	1420	ARCE	5		1350.3	1352.1	4.5				
	4995	ATHN	2	S/F	1417.3	1429.5	24.3	23.5	14.1		
17	4995	ATHN	2	S/F	0651.3	0655.2	17.7	24.8	14.9		
	260	ONDR	8	S	0918	0918	.3	27			
	4995	ATHN	2	S/F	0922.6	0933.2	26.8	27.5	16.5		
	4995	ATHN	1	S/F	1425.2	1430.5	18.1	19.3	9.6		
	2800	OTTA	24O	R	2135	2155	20	1.4	0.7		
18	260	ONDR	3	S	0812.3	0812.3	.2	4			
	536	ONDR	3	S	1008.2	1008.2	.3	10			
	260	ONDR	40	F	1150.3	1150.3	13	8			
	2800	OTTA	20	GRF	1300	1317	50	08	0.4		
	536	ONDR	8	S	1340.2	1340.2	.3	35			
	2695	PENT	27	RF	2225		95	0.8	0.6		
	2695	PENT	24	R	2225	2235	10	0.8	0.4		
	2695	PENT	24P	R	2235		55	0.8			
	2695	PENT	26	FAL	2330	2400	30	-0.9	-0.4		
19	2800	OTTA	27	RF	1255		190	1.6	1.4		

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

AUGUST 1977

AUG 1977	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY MEAN	INT	POLARIZATION OR REMARKS
	2800	OTTA	24 R	1255	1330	35	1.6	1		
	2800	OTTA	24P R	1330		120	1.6			
	2800	OTTA	26 FAL	1520	1605	45	-1.6	-0.8		
20	260	ONDR	4 S/F	1500.8	1502.3	2.5	8			
21	200	HIRA	44 NS	0015 E	0740	540 D	10	2		SR
	260	ONDR	44 NS	0645 E		500 D	101			
	202	IZMI	44 NS	0700		300	70			
	127	TORN	43 NS	0840 U	1016	200 U	20			V=1
	245	SGHR	44 NS	1000 E	1552.5	612 D	174.6			
	208	VORO	43 NS	2153	2207	187	10	7		
	127	TORN		0840 U	1124.6		25			
	536	ONDR	8 S	1037	1037	.3	31			
	2800	OTTA	20 GRF	1206	1214	12	1.4	0.7		
	2800	OTTA	24 R	1420	1600	100	2.4	1.2		
	2800	OTTA	27A RF	1420		305	2.4	1.8		
	536	ONDR	8 S	1439.2	1439.2	.3	91			
	2800	OTTA	1A S	1555	1556	4	1	0.5		
	2800	OTTA	8 S	1557.5	1557.7	0.5	3.2	1.6		
	2800	OTTA	24P R	1600		135	2.4			
	2800	OTTA	26 FAL	1815	1925	70	-2.4	-1.2		
	2800	OTTA	240 R	1930	2000	30	1.4	0.7		
	2800	OTTA	20 GRF	2030	2340	300	2.8	1.8		
22	260	ONDR	44 NS	0650 E		510 D	10			
	228	HARS	47 GB	1252.5	1317 U	40	135 D	135 D		
	228	HARS		1252.5	1256 U	10	135 D			
	536	ONDR	8 S	1320.5	1320.5	.3	36			
	7000	SAOP	20 GRF	1454.5		15.2	5.5			
	2695	PENT	20 GRF	2250	2430	180 D	3.8			
23	3100	CRIM	26 FAL	0748	1107		3			
	4995	BOUL	40 F	2257.5	2303	7.5	102	33		
	2695	BOUL	45 C	2300	2301.5	4	32	11		
	4995	BOUL	2 SF	2325.5	2326	2.5	10	3		
	2695	BOUL	2 SF	2330	2330.5	2.5	4	1		
	4995	BOUL	8 S	2333.5	2334.5	1.5	32	11		
	2695	BOUL	8 S	2334	2335	1.5	7	2		
24	260	ONDR	42 SER	1251.5	1311.5	90	162			
	7000	SAOP	22 GRF	1624.6		22.6	4			
25	200	HIRA	45 C	0121	0121.5	1	500	50		O
	3100	CRIM	24 R	0527	0808		4			
	2800	OTTA	20 GRF	1830	1845	50	1	0.5		
	500	HIRA	45 C	2150.7	2151.6	3	90	25		SL
26	500	HIRA	45 C	0302.8	0303	.8	12	4		SL
	200	HIRA	45 C	0303	0303.3	1	500	40		WR
	200	HIRA	45 C	0404	0404.4	1	800	20		WR
	100	HIRA	45 C	0404.3	0404.5	.5	1200	250		WL
	606	MANI	48 F	0502	0506.5	5.5	33	7.2		
	606	MANI	40 F	0502	0506.5	5.5	33	7.2		
	500	HIRA	45 C	0502.7	0506.5	5	240	50		ML
	200	HIRA	45 C	0502.7	0504	2	600	45		WL
	1400	SYDN	40 F	0502.9	0504.7	1.8	63			
	2000	TYKW	45 C	0502	0504.3	4	4	.5		45L
	1000	TYKW	45 C	0502	0503	4	8.7	1.3		
	100	HIRA	45 C	0503	0503	.5	1200	500		WL
	1415	MANI	1 S	0503	0504.5	4.5	9.1	1.1		
	1415	MANI	1 S	0503	0504.5	4.5	9.1	1.1		
	700	SYDN	40 F	0503.1	0504.7	1.6	26			
	1000	TYKW	45 C	0516.5	0517	1	2	.4		
	500	HIRA	45 C	0524	0524.3	1.7	11	5		ML
	200	HIRA	45 C	0524	0525	2	500	15		O
	1000	TYKW	45 C	0524	0524.9	2	.8	.2		
	200	HIRA	45 C	0535	0538	7.3	700	50		O
	1000	TYKW	45 C	0536	0538.8	12	71	8		
	100	HIRA	45 C	0537	0539	13	1200	250		WL
	500	HIRA	48 C	0537	0538.6	15	3500	1000		SL
	606	MANI	47 GB	0537	0539.2	7	1570	215		
	606	MANI	47 GB	0539.7	0540.9		345			
	1415	MANI	4 S/F	0537.9	0539.2	6.1	129	17.1		
	2695	MANI	3 S	0537.9	0538.8	6.1	15.4	3.4		
	4995	MANI	3 S	0537.9	0538.8	6.1	16.5	9.7		
	8800	MANI	3 S	0537.9	0538.8	6.1	26.1	5.8		
	1415	MANI	4 S/F	0537.9	0539.2	6.1	129	17.1		
	2695	MANI	3 S	0537.9	0538.8	6.1	15.4	3.4		
	4995	MANI	3 S	0537.9	0538.8	6.1	16.5	9.7		
	8800	MANI	3 S	0537.9	0538.8	6.1	26.1	5.8		
	2000	TYKW	45 C	0537	0538.5	6	30	7		30L
	4995	ATHN	2 S/F	0538.2	0538.6	1.6	13.3	8		
	35000	NAGO	5 S	0538.5	0538.5	1 D	15			
	3750	TYKW	45 C	0538	0538.4	4	12	2		

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

AUGUST 1977

AUG 1977	FREQUENCY	STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY MEAN	INT	POLARIZATION OR REMARKS
	9400	TYKW	45 C	0538	0538.4	6	35	7		OR
	1000	TYKW	5 S	0630.5	0630.8	1	3.5	.7		
	237	TRST	42 SER	0630.5	0632.2	1.8	1130			20L
	100	HIRA	45 C	0630.5	0630.5	1	1200	400		WL
	200	HIRA	45 C	0630.7	0631	1	500	60		O
	202	IZMI	42 SER	0631	0631	3	200			
	260	ONDR	44 NS	0635 E		511	138			
	240	OWIN	45 C	0731	0731.5	1	10	2		
	160	OWIN	45 C	0731	0731.5	1	50	5		
	237	TRST	5 S	0747.5	0747.6	.1	145	46		8L
	245	SGMR	44 NS	1006 E	1646.4	797 D	79.9			3.5
	410	SGMR	43 NS	1821.8	1822.2	301.2D	75.8			3
	200	HIRA	44 NS	2010 E	2200	470 D	10	2		SR
	208	VORO	44 NS	2100		240		10		
	160	OWIN	45 C	1030.5	0732	1.5	25	2		
	5730	IRKU	45 C	1417	1419.7	6	3			L
	5731	IRKU		1417	1421.5		16			K
	240	OWIN	45 C	1419	1419.5	1	10	3		
	160	OWIN	45 C	1419	1419.5	1	140	5		
	240	OWIN	45 C	1421	1421.5	1	13	3		
	160	OWIN	45 C	1421	1421.5	1	35	5		
	2800	OTTA	240 R	1435	1530	55	1.2	0.6		
	237	TRST	41 F	1645.8	1645.8	.2	510			19L
	237	TRST	42 SER	1703.3	1704.7	2	150			10L
	2800	OTTA	1 S	1721	1722.2	2	1.2	0.6		
	2695	SGMR	3 S	1948.8	1953.4	6.3	15.7	7.9		
	4995	SGMR	1 S	1951.1	1953.3	7.1	2.9	1.5		
	1420	BOUL	45 C	1951.5	1953	4	71	24		
	410	SGMR	7 C	1952	1952.3	3.4	474	142.2		
	606	SGMR	3 S	1952	1953	4.5	156.8	47		
	1415	SGMR	3 S	1952.2	1952.9	4.2	209.2	62.7		
	2800	OTTA	45 C	1952	1953.3	4	18.8	2.6		
	2695	BOUL	45 C	1953.5	1954.5	1.5	15	5		
	2800	OTTA	20 GRF	2015	2136	120	2.2	0.8		
27	100	HIRA	45 C	0045.5	0046	1	270	50		WL
	127	TORN	44 NS	0700 E		430 D				V=0
	260	ONDR	44 NS	0710 E		482 D	34	4		
	245	SGMR	44 NS	1007 E	1632.3	795 D	64.2			SWF
	200	HIRA	44 NS	2010 E	0345	780 D	27	5		SR
	208	VORO	44 NS	2100	0031	240	17	9		
	9100	GORK	20 GRF	0710.3	0721.7	39.3	7.6	3.5		
	4995	SGMR	4 S/F	1059.3	1102.2	4.8	52.3	15.7		SWF
	2695	SGMR	4 S/F	1059.8	1102.2	4.1	38.3	11.5		SWF
	7000	SAOP	3 S	1100.6	1102.4	3.3	64.6	21.5		
	7000	SAOP	29 PBI	1103.9		47.6				
	1420	ARCE	3	1100.9	1102.1	2.1				
	4995	ATHN	3 S	1101	1102.1	3	47.5	14.3		
	8800	SGMR	4 S/F	1101.3	1102.4	2.7	43.7	13.1		SWF
	15400	SGMR	4 S/F	1101.7	1102.3	2	24.8	7.4		SWF
	1415	SGMR	1 S	1101.8	1102.3	2.1	4.7	1.4		SWF
	9500	BERL	4	1101	1102.5	3	44			
	1470	BERL	4	1101	1101.9	2.5	6.6			
	3000	BERL	4	1101	1101.8	2.5	27			
	1420	ARCE	29	1103		50				
28	100	HIRA	45 C	0202	0202.3	.7	600	150		WL
	202	IZMI	44 NS	0700		300	40			
	260	ONDR	44 NS	0722 E		468 D	27	3		
	245	SGMR	44 NS	1008 E	1152.4	792 D	79.2			
	160	OWIN	44 NS	1621 E		93 D		5		
	536	ONDR	8 S	1228	1228	.3	45			
	2800	OTTA	240 R	2010	2100	50	1.4	0.7		
29	260	ONDR	44 NS	0642 E		586 D	34			
	245	SGMR	44 NS	1009 D	1456.4	790 D	26.9			J
	160	OWIN	44 NS	1022 E		90 D		3		
	202	IZMI	6 S	0917	0917	1	70	30		
	536	ONDR	3 S	1057.3	1057.3	.2	18			
	237	TRST	41 F	1228.4	1228.5	.1	70			16L
	228	HARS	1 S	1454.5	1455.5	4	43	19		
	237	TRST	41 F	1455	1456.3	1.3	88			5L
30	240	OWIN	45 C	0846	0846.5	1	15	3		
	160	OWIN	45 C	0846	0846.5	1	25	5		
31	260	ONDR	40 F	0956.8	0956.8	17	7	1		
	3000	BERL	3	1005.5	1011.2					
	1470	BERL	4	1005.5	1007	5.5	18	6.5		
	536	ONDR	2 S/F	1005.6	1007.3	4.5	14	4		
	806	ONDR	2 S/F	1005.8	1007.1	4	30	10		
	3100	CRIM	5 S	1006	1009	26	3	1		
	1420	ARCE	4	1006.1	1008.3	4.5				
	408	TRST	3 S	1006.9	1007.3	1.2	13			
	930	BORD	46 C	1006	1007	4	77	8		

22
Aug 77

SOLAR RADIO EMISSION
OUTSTANDING OCCURRENCES

AUGUST 1977

AUG 1977	FREQUENCY STATION	TYPE	STARTING TIME UT	TIME OF MAXIMUM UT	DURATION MINUTES	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} PEAK	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1} MEAN	INT	POLARIZATION OR REMARKS
	9100 GORK	20 GRF	1009.3	1027.1	74 D	7.4			
	3100 CRIM	8 S	1010.6	1010.8	.4	4	1		
	160 DWIN	45 C	1201.8	1202	1	120	5		
	160 DWIN	45 C	1248.6	1249	1	300 D	10		
	160 DWIN	45 C	1303.6	1303.8	.4	30	5		
	4995 BOUL	45 C	1913	1915	5	24	8		
	4995 BOUL	45 C	1955.5	1958	8	32	11		

Reports received from the following observatories:

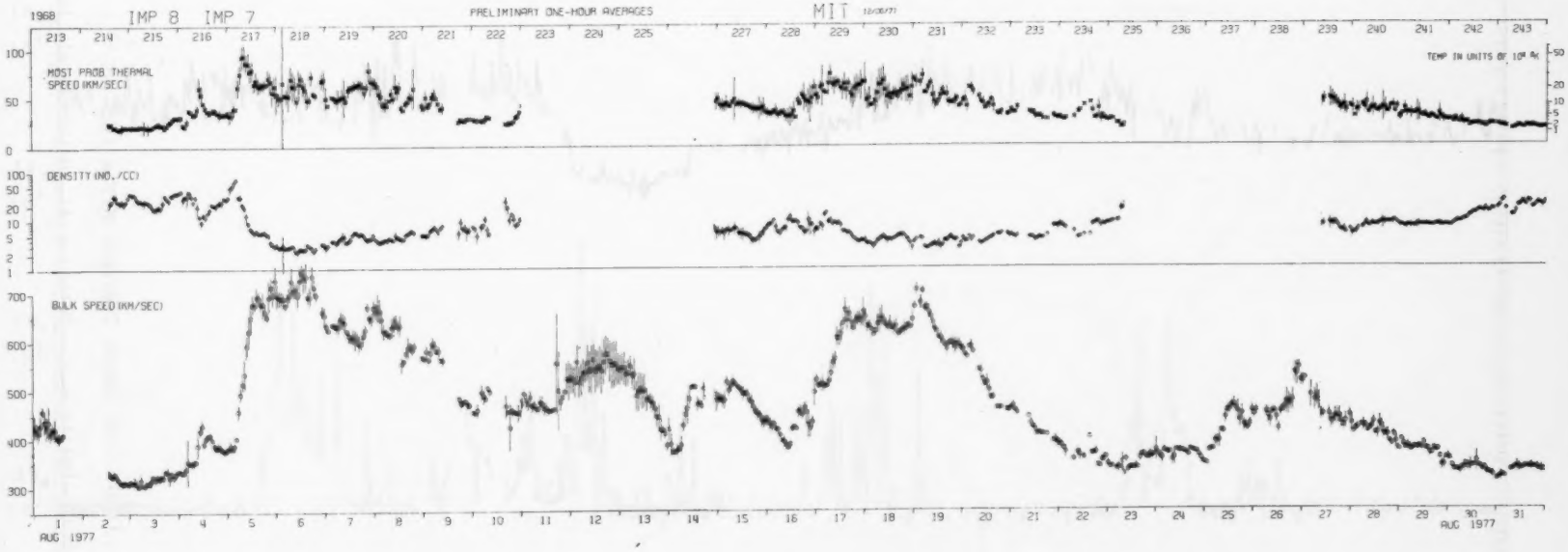
ARCE = Arcetri
BERL = Berlin-Adlershof
BORD = Bordeaux
BOUL = Boulder
CRIM = Simferopol
DWIN = Dwingeloo
GORK = Gorky
HARS = Harestua
HIRA = Hiraiso
HUAN = Huancayo
IRKU = Irkutsk
KIEV = Kiev
MANI = Manila
MCMA = McMath-Hulbert
NAGO = Nagoya
ONDR = Ondrejov
OTTA = Ottawa
PENT = Penticton
POTS = Potsdam
SAOP = Sao Paulo
SGMR = Sagamore Hill
SYDN = Sydney
TORN = Torun
TYKW = Toyokawa
TRST = Trieste
VORO = Voroshilov (Ussurisk)

Explanation of Type Code:

1 Simple 1
2 Simple 1F
3 Simple 2
4 Simple 2F
5 Simple
6 Minor
7 Minor +
8 Spike
20 Simple 3
21 Simple 3A
22 Simple 3F
23 Simple 3AF
24 Rise
25 Rise A
26 Fall
27 Rise and Fall
28 Precursor
29 Post Burst Increase
30 Post Burst Increase A
31 Post Burst Decrease
32 Absorption
40 Fluctuation
41 Group of Bursts
42 Series of Bursts
43 Onset of Noise Storm
44 Noise Storm in Progress
45 Complex
46 Complex F
47 Great Burst
48 Major
49 Major +

IMP 7 AND 8 SOLAR WIND PLASMA

AUGUST 1977

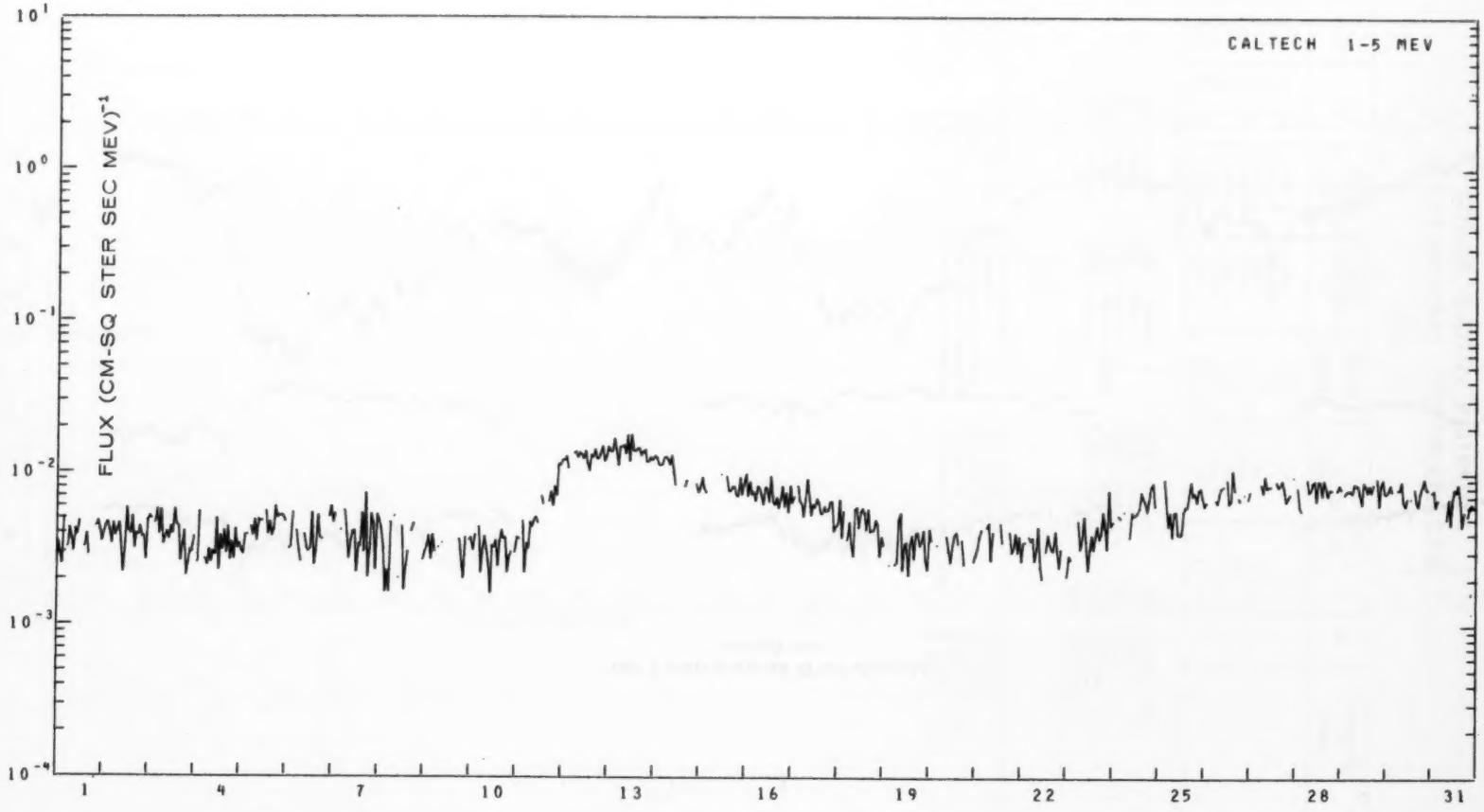


23
Aug 77

IMP 7 AND 8 ELECTRONS

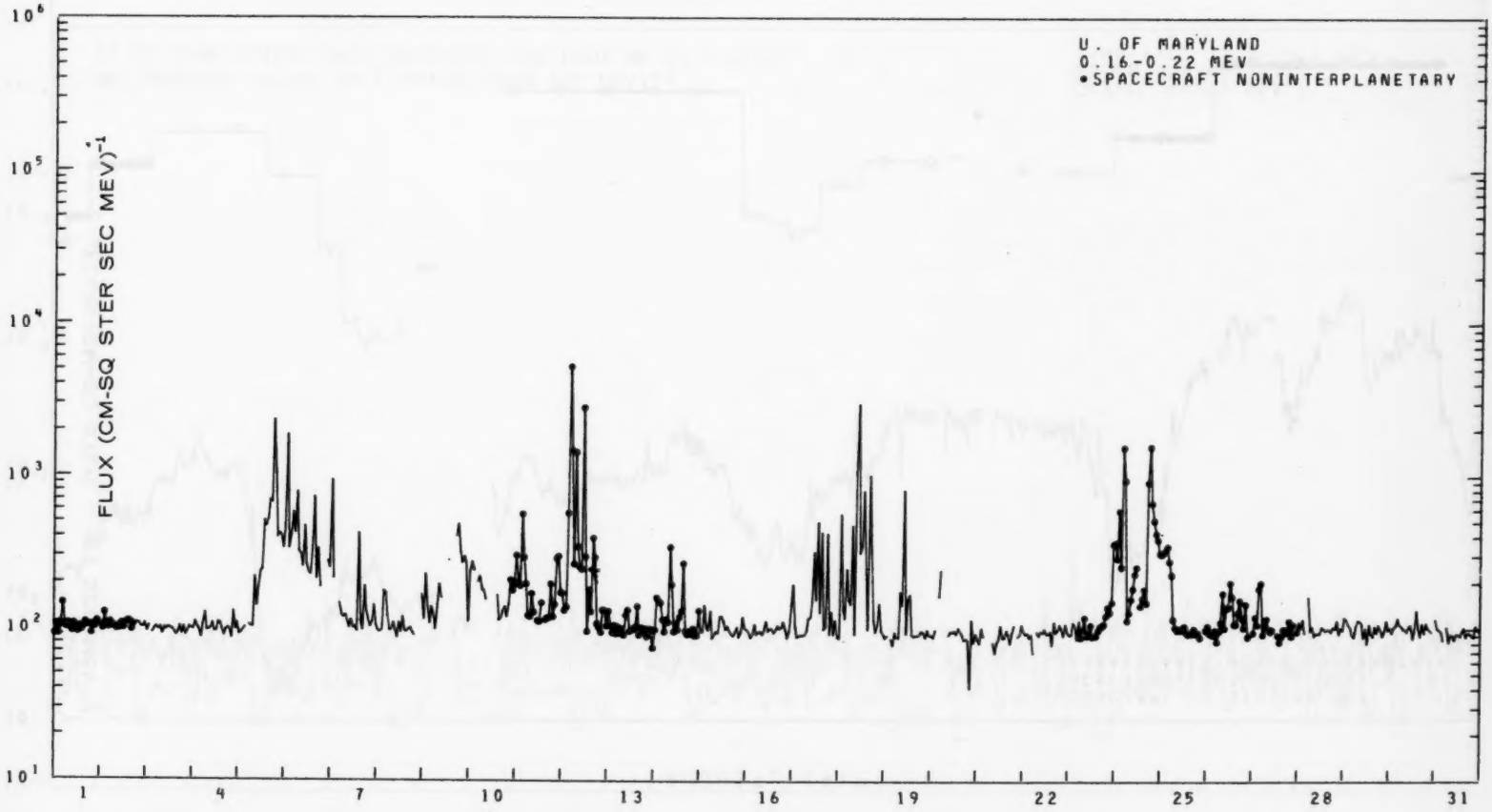
AUGUST, 1977

24 Aug 77



IMP 7 AND 8 LOW ENERGY PROTONS

AUGUST, 1977

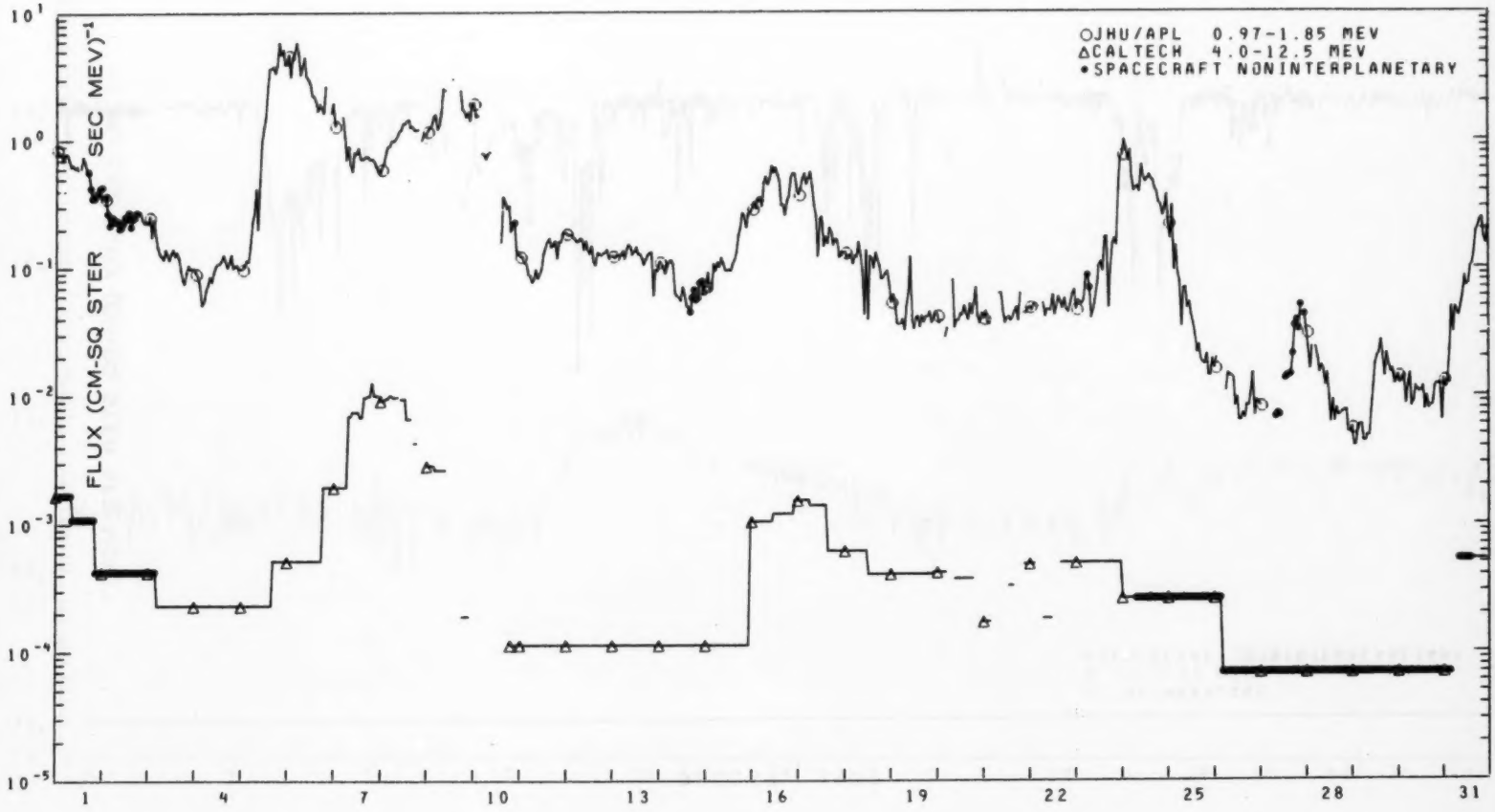


25 Aug 77

26
Aug 77

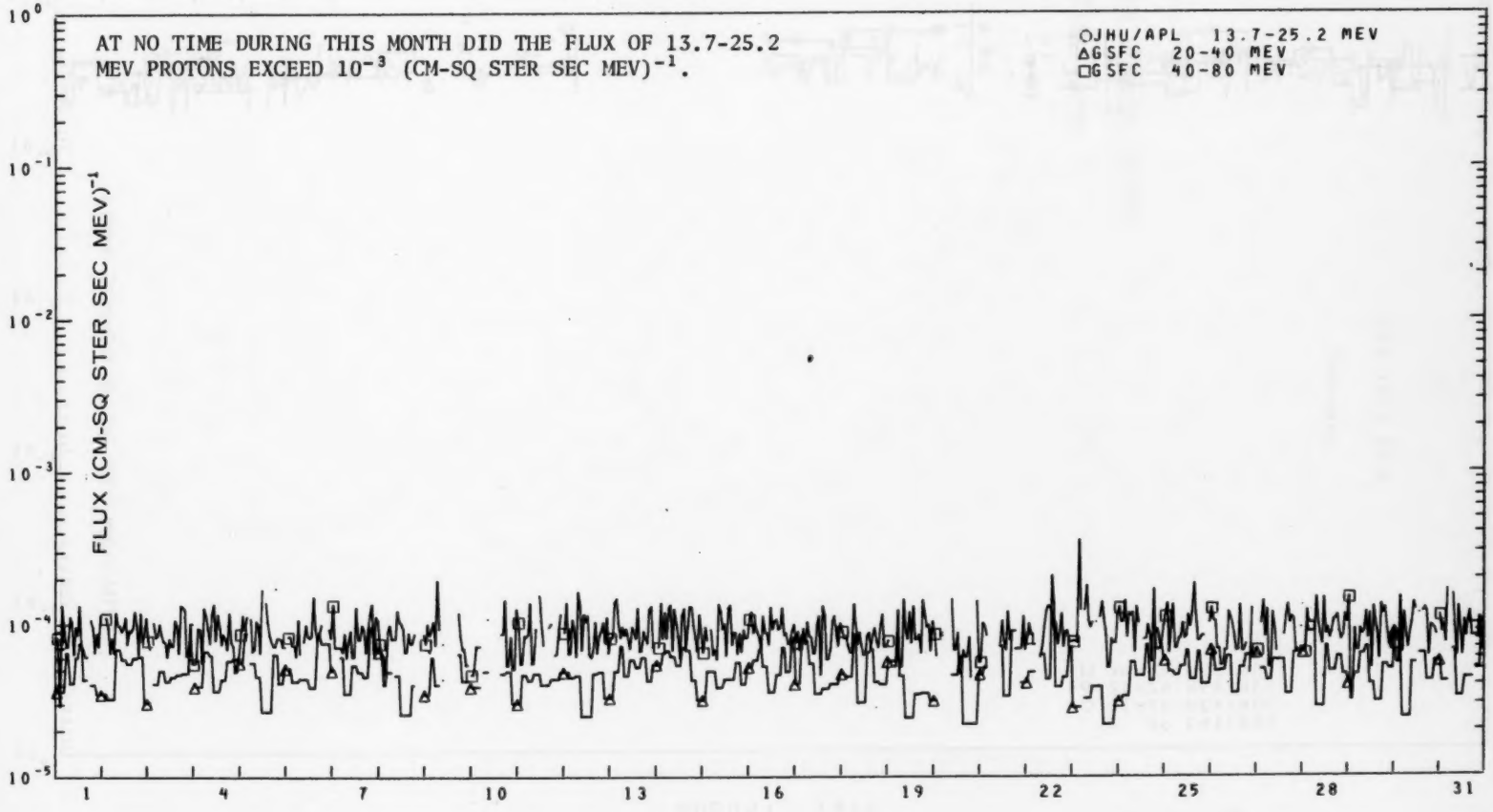
IMP 7 AND 8 INTERMEDIATE ENERGY PROTONS

AUGUST, 1977



IMP 7 AND 8 HIGH ENERGY PROTONS

AUGUST, 1977

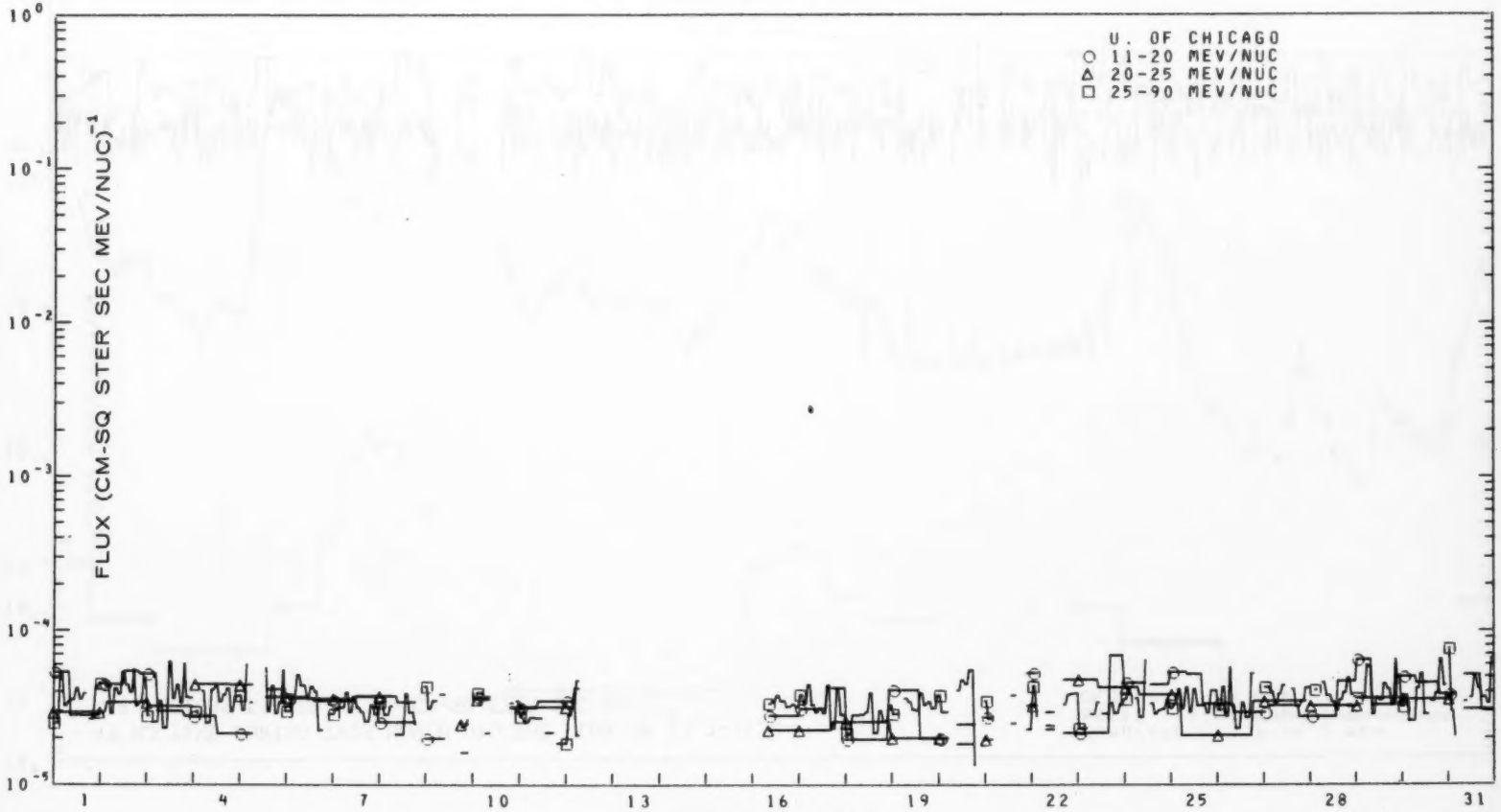


27 Aug 77

IMP 7 AND 8 ALPHA PARTICLES

AUGUST, 1977

28 Aug 77



JULY 1977 DATA

Contents

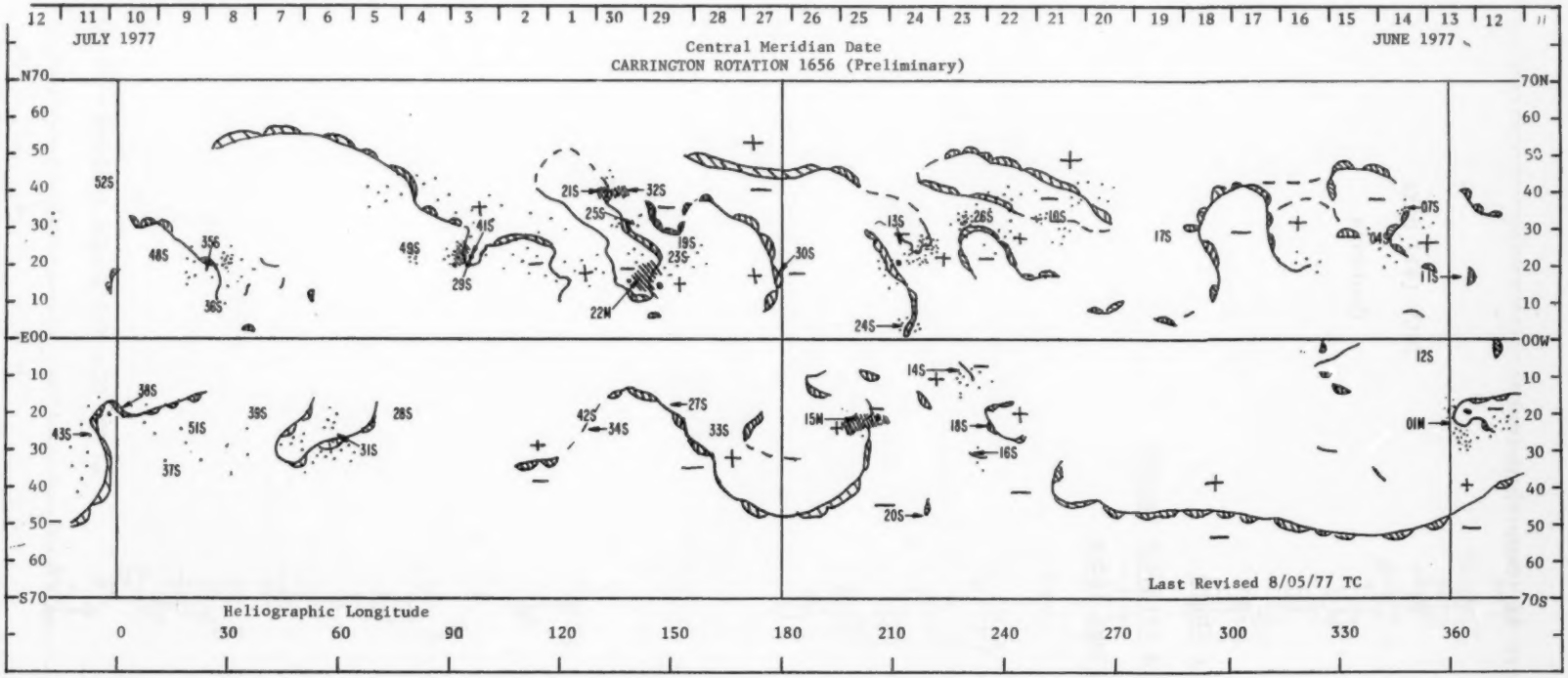
	Page
Hα Synoptic Chart	30-31
Abbreviated Calendar Record	32-39
Regional Flare Index	39

30
Jul 77

ABBREVIATED CALENDAR RECORD

Hα SYNOPTIC CHART

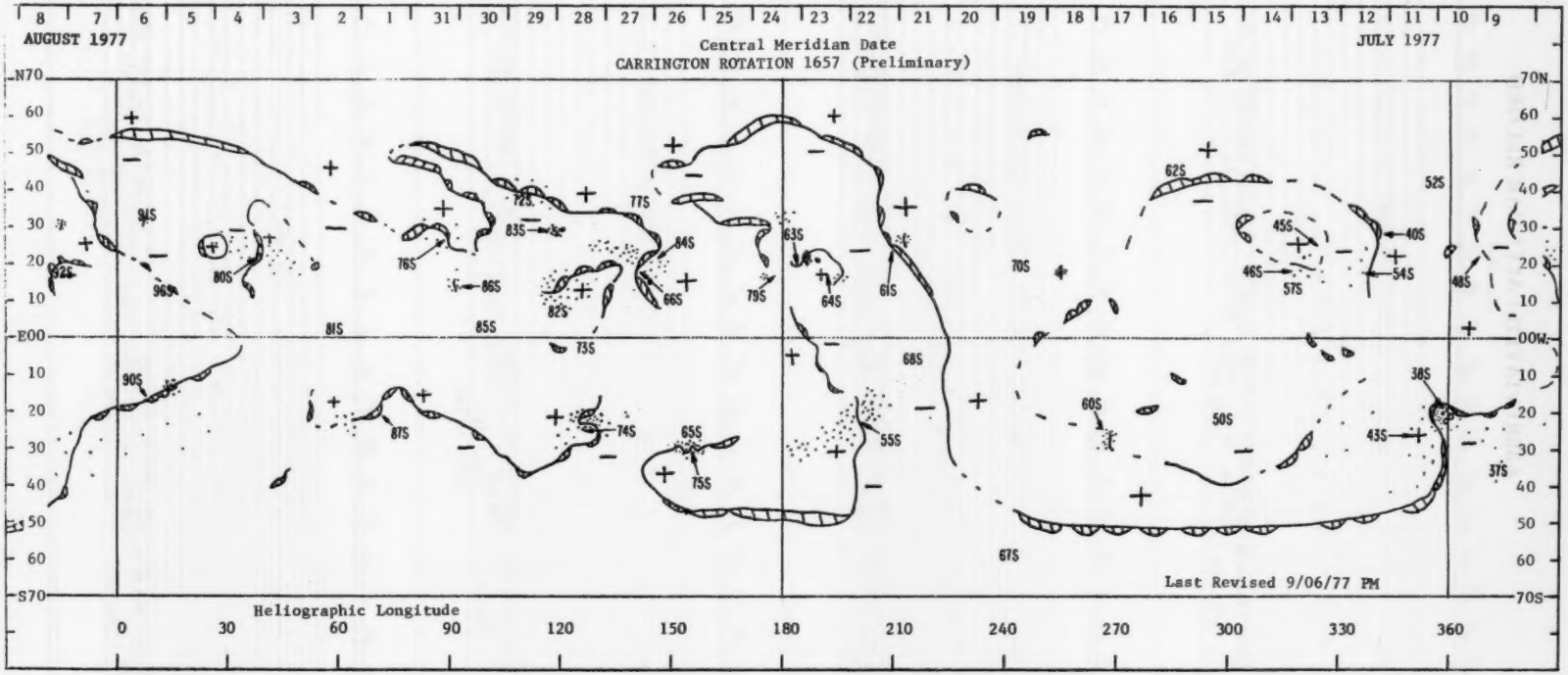
JUNE 1977 - JULY 1977



ABBREVIATED CALENDAR RECORD

Hα SYNOPTIC CHART

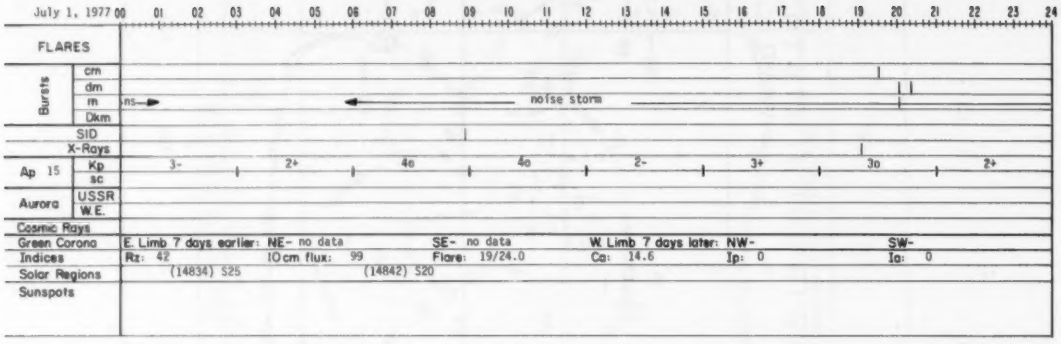
JULY - AUGUST 1977

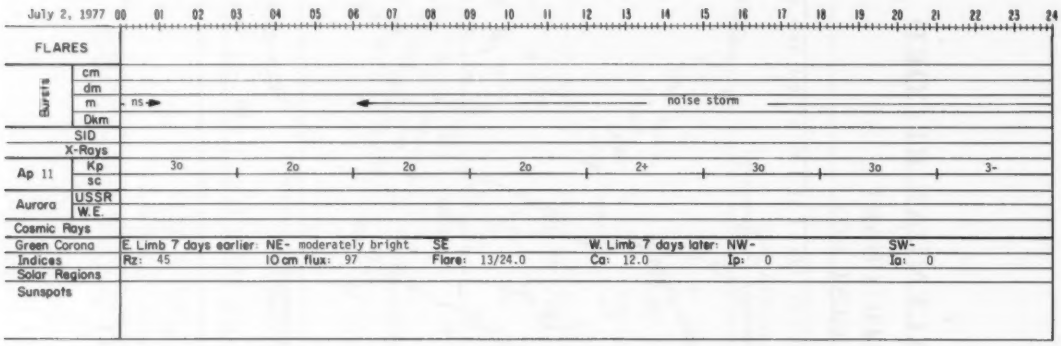


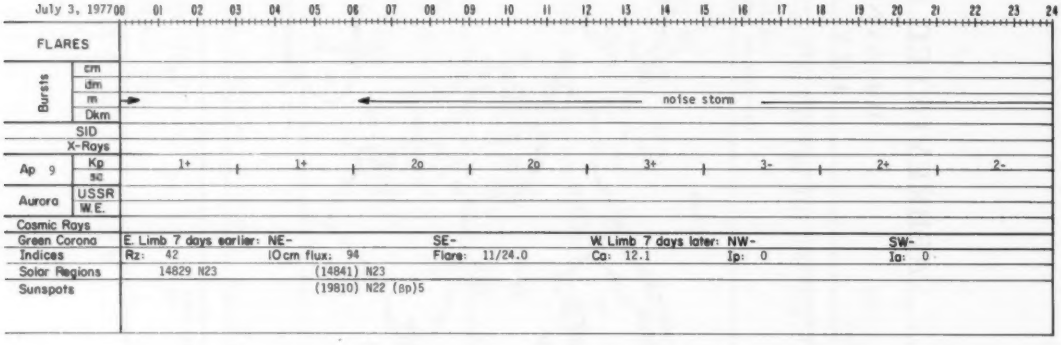
31
Jul 77

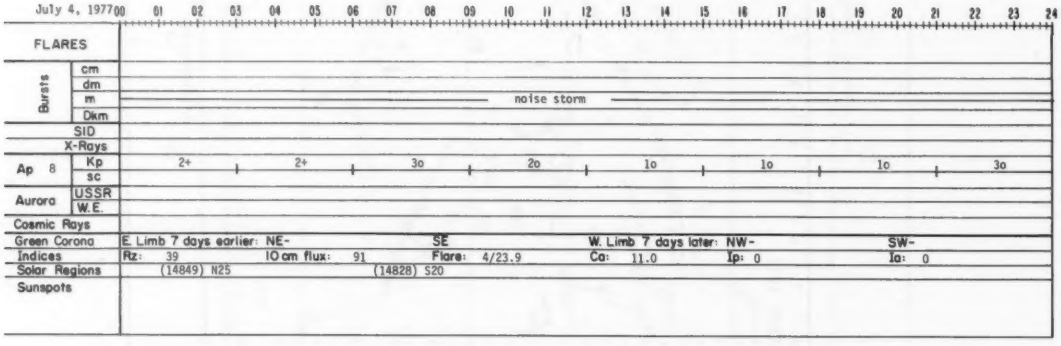
ABBREVIATED CALENDAR RECORD

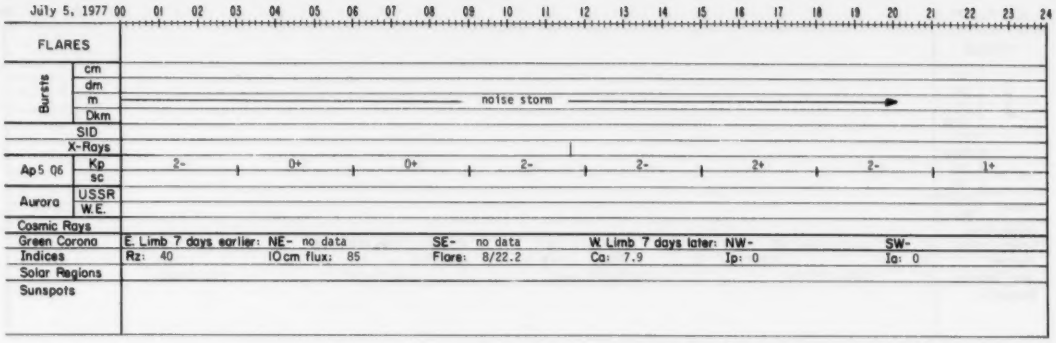
JULY 1977

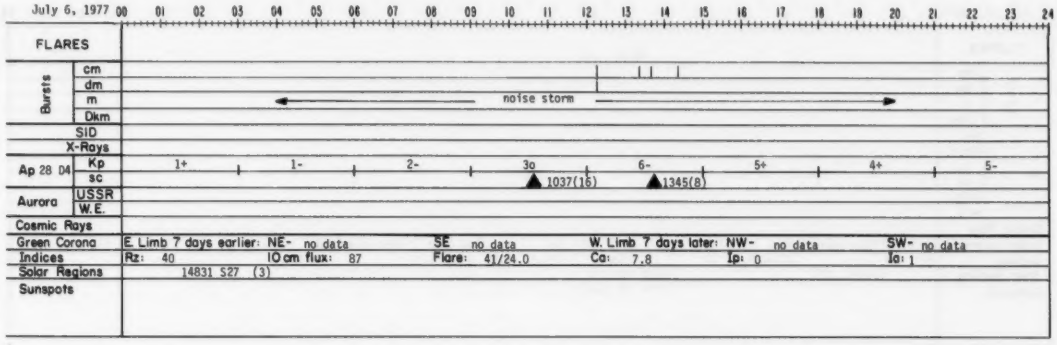


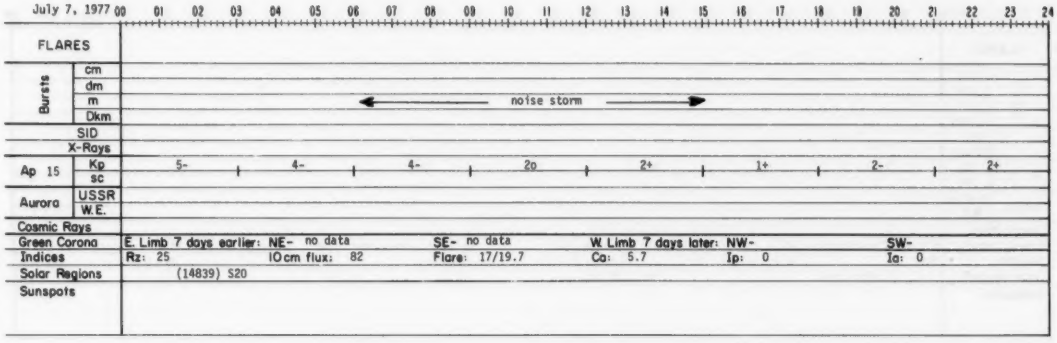


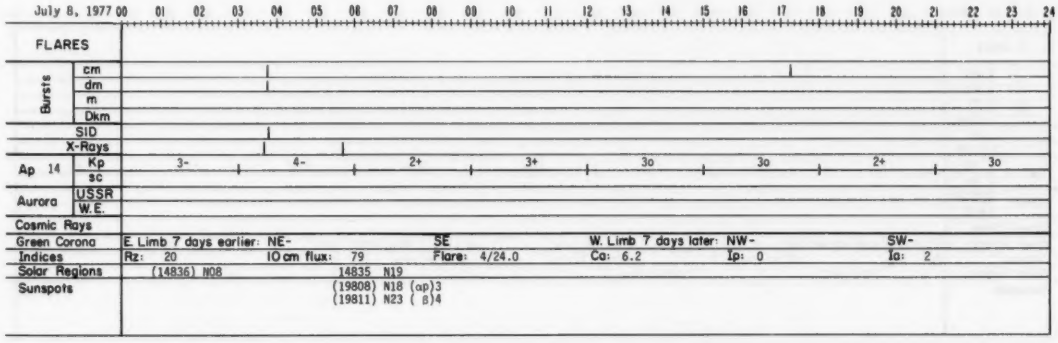


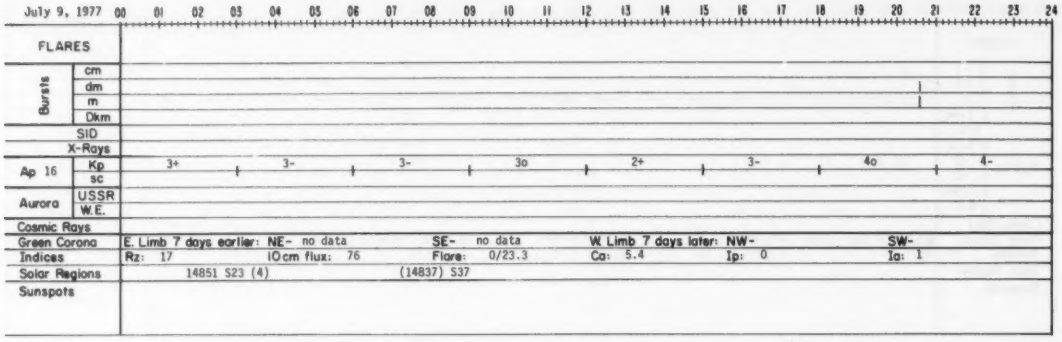


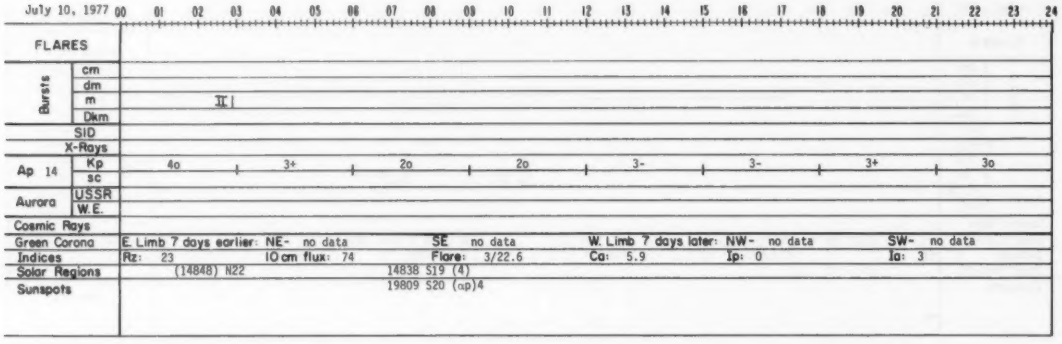

July 5, 1977
FLARES
Bursts
cm
dm
m
Dkm
noise storm
SID
X-Rays
Ap 5 Q6
Kp
sc
2- 0+ 0+ 2- 2- 2+ 2- 1+
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- no data SE- no data W. Limb 7 days later: NW- SW-
Indices
Rz: 40 10cm flux: 85 Flare: 8/22.2 Ca: 7.9 Ip: 0 Ia: 0
Solar Regions
Sunspots

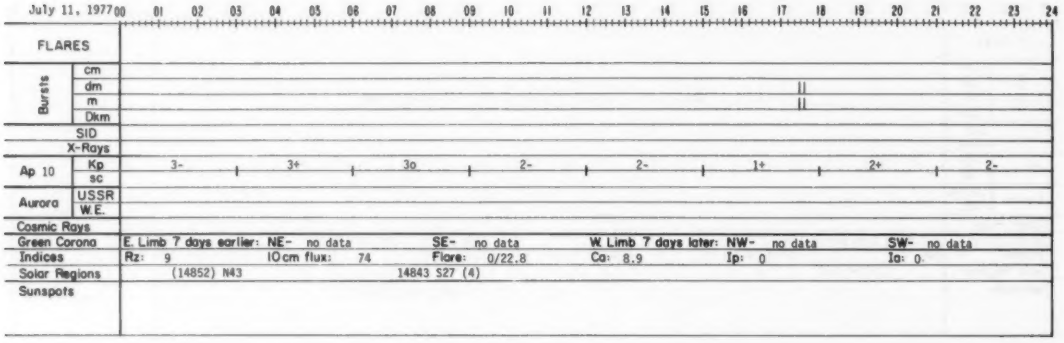

July 6, 1977
FLARES
Bursts
cm
dm
m
Dkm
noise storm
SID
X-Rays
Ap 28 Q4
Kp
sc
1+ 1- 2- 3o 6- 5+ 4+ 5-
1037(16)
1345(8)
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- no data SE no data W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 40 10cm flux: 87 Flare: 41/24.0 Ca: 7.8 Ip: 0 Ia: 1
Solar Regions
14831 S27 (3)
Sunspots

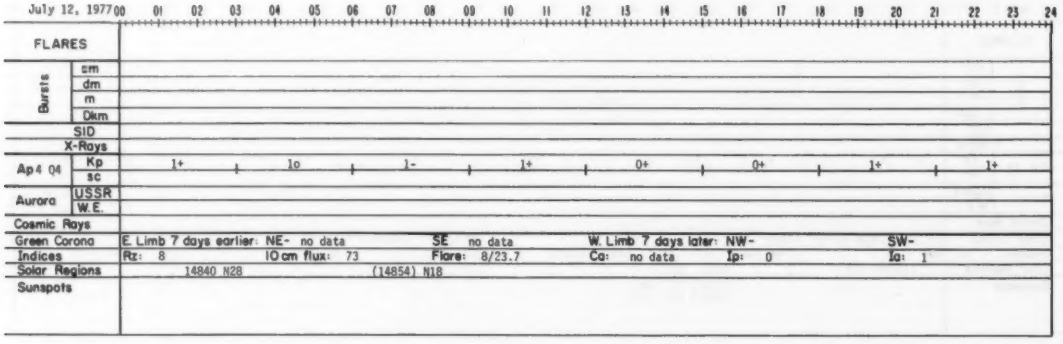

July 7, 1977
FLARES
Bursts
cm
dm
m
Dkm
noise storm
SID
X-Rays
Ap 15
Kp
sc
5- 4- 4- 2o 2+ 1+ 2- 2+
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- no data SE- no data W. Limb 7 days later: NW- SW-
Indices
Rz: 25 10cm flux: 82 Flare: 17/19.7 Ca: 5.7 Ip: 0 Ia: 0
Solar Regions
(14839) S20
Sunspots


July 8, 1977
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap 14
Kp
sc
3- 4- 2+ 3+ 3o 3o 2+ 3o
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- SE W. Limb 7 days later: NW- SW-
Indices
Rz: 20 10cm flux: 79 Flare: 4/24.0 Ca: 6.2 Ip: 0 Ia: 2
Solar Regions
(14836) N08 14835 N19
Sunspots
(19808) N18 (αp)3
(19811) N23 (β)4


July 9, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap 16
Kp
3+ 3- 3- 3o 2+ 3- 4o 4-
sc
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- no data SE- no data W. Limb 7 days later: NW- SW-
Indices
Rz: 17 10cm flux: 76 Flare: 0/23.3 Ca: 5.4 Ip: 0 Ia: 1
Solar Regions
14851 S23 (4) (14837) S37
Sunspots


July 10, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap 14
Kp
4o 3+ 2o 2o 3- 3- 3+ 3o
sc
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- no data SE no data W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 23 10cm flux: 74 Flare: 3/22.6 Ca: 5.9 Ip: 0 Ia: 3
Solar Regions
(14848) N22 14838 S19 (4)
Sunspots
19809 S20 (ap)4


July 11, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap 10
Kp
3- 3+ 3o 2- 2- 1+ 2+ 2-
sc
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- no data SE- no data W. Limb 7 days later: NW- no data SW- no data
Indices
Rz: 9 10cm flux: 74 Flare: 0/22.8 Ca: 8.9 Ip: 0 Ia: 0
Solar Regions
(14852) N43 14843 S27 (4)
Sunspots


July 12, 1977
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
FLARES
Bursts
cm
dm
m
Dkm
SID
X-Rays
Ap4 04
Kp
1+ 1o 1- 1+ 0+ 0+ 1+ 1+
sc
Aurora
USSR
W.E.
Cosmic Rays
Green Corona
E. Limb 7 days earlier: NE- no data SE no data W. Limb 7 days later: NW- SW-
Indices
Rz: 8 10cm flux: 73 Flare: 8/23.7 Ca: no data Ip: 0 Ia: 1
Solar Regions
14840 N28 (14854) N18
Sunspots

July 13, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES		
Bursts	cm	
	dm	
	m	
	Dkm	
SID		
X-Rays		
Ap 9	Kp	3- 3- 2o 1+ 2+ 2o 3- 2o
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- SE- W. Limb 7 days later: NW- SW-
Indices		Rz: 10 10cm flux: 75 Flare: 11/23.8 Ca: 3.4 Ip: 0 Ia: 0
Solar Regions		(14845) N25 (14846) N19 (14857) N13
Sunspots		

July 14, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES		1n/38
Bursts	cm	
	dm	
	m	
	Dkm	
SID		
X-Rays		
Ap 18	Kp	3+ 5- 5- 4- 2o 2- 2o 1+
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- no data SE no data W. Limb 7 days later: NW- no data SW- no data
Indices		Rz: 7 10cm flux: 74 Flare: 24/23.9 Ca: 2.3 Ip: 0 Ia: 2
Solar Regions		
Sunspots		

July 15, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES		
Bursts	cm	
	dm	
	m	
	Dkm	
SID		
X-Rays		
Ap 12	Kp	3- 3o 3- 2o 2+ 3- 3- 3+
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- SE- W. Limb 7 days later: NW- no data SW- no data
Indices		Rz: 0 10cm flux: 74 Flare: 0/24.0 Ca: 0.9 Ip: 0 Ia: 1
Solar Regions		(14850) S22
Sunspots		

July 16, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES		
Bursts	cm	
	dm	
	m	
	Dkm	
SID		
X-Rays		
Ap 27 03	Kp	3- 3- 4+ 5o 4o 4o 3+ 5-
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- SE W. Limb 7 days later: NW- no data SW- no data
Indices		Rz: 0 10cm flux: 74 Flare: 1/22.1 Ca: 2.8 Ip: 0 Ia: 4
Solar Regions		(14862) N46
Sunspots		

July 17, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES		
Bursts	cm	
	dm	
	m	
	Dkm	
SID		
X-Rays		
Ap 14	Kp	3o 3- 3o 3- 2- 3o 3+ 4-
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- SE- W. Limb 7 days later: NW- no data SW- no data
Indices		Rz: 0 10cm flux: 74 Flare: 0/23.2 Ca: 4.6 Ip: 0 Ia: 2
Solar Regions		(14860) S25
Sunspots		(19812) S27 (af)3

July 18, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES		
Bursts	cm	
	dm	
	m	
	Dkm	
SID		
X-Rays		
Ap 7 09A	Kp	2o 2- 2- 2- 3- 2+ 2- 2o
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- SE W. Limb 7 days later: NW- no data SW- no data
Indices		Rz: 0 10cm flux: 74 Flare: 0/24.0 Ca: 7.1 Ip: 0 Ia: 2
Solar Regions		
Sunspots		

July 19, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES		1f/63
Bursts	cm	
	dm	
	m	
	Dkm	1M
SID		
X-Rays		
Ap 23 D5	Kp	3+ 2o 4+ 4- 4+ 4+ 4o 3o
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- SE- W. Limb 7 days later: NW- no data SW- no data
Indices		Rz: 7 10cm flux: 74 Flare: 4/23.7 Ca: 6.8 Ip: 0 Ia: 2
Solar Regions		(14870) N20 (14867) S58
Sunspots		(19818) N21 (8)2

July 20, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES		
Bursts	cm	
	dm	
	m	
	Dkm	
SID		
X-Rays		
Ap 29 D2	Kp	4o 4o 5o 5- 4+ 3+ 4- 3+
	sc	
Aurora	USSR	
	W.E.	
Cosmic Rays		
Green Corona		E. Limb 7 days earlier: NE- no data SE no data W. Limb 7 days later: NW- SW- moderately bright
Indices		Rz: 8 10cm flux: 78 Flare: 0/23.9 Ca: 6.8 Ip: 0 Ia: 3
Solar Regions		
Sunspots		

July 21, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES — 1n/74

Bursts: cm, dm, m — noise storm, Dkm

SID

X-Rays

Ap 10 — Kp: 4- 3- 3- 1+ 2o 2o 2+ 2o — sc

Aurora: USSR, W.E.

Cosmic Rays

Green Corona — E. Limb 7 days earlier: NE- SE- W. Limb 7 days later: NW- SW- bright

Indices — Rz: 8 10 cm flux: 79 Flare: 3/22.6 Ca: 9.0 Ip: 0 Ia: 2

Solar Regions — 14868 S06

Sunspots

July 22, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm, dm, m, Dkm

SID

X-Rays

Ap 11 — Kp: 3o 3- 3o 3+ 1+ 2o 2o 2+ — sc

Aurora: USSR, W.E.

Cosmic Rays

Green Corona — E. Limb 7 days earlier: NE- SE moderately bright W. Limb 7 days later: NW- no data SW- no data

Indices — Rz: 23 10 cm flux: 80 Flare: 7/24.0 Ca: 11.2 Ip: 0 Ia: 2

Solar Regions — 14861 N24 (3) 14855 S23 (3)

Sunspots

July 23, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm, dm, m, Dkm

SID

X-Rays

Ap 6 Q7 — Kp: 3- 2o 2o 1- 2- 1- 1- 1+ — sc

Aurora: USSR, W.E.

Cosmic Rays

Green Corona — E. Limb 7 days earlier: NE- SE- moderately bright W. Limb 7 days later: NW- no data SW- no data

Indices — Rz: 30 10 cm flux: 82 Flare: 3/23.0 Ca: 14.8 Ip: 0 Ia: 1

Solar Regions — (14864) N17 (19814) N16 (G)2

Sunspots

July 24, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm, dm, m, Dkm

SID

X-Rays

Ap7 Q8A — Kp: 2- 1+ 1+ 2o 2o 2- 3- 2o — sc

Aurora: USSR, W.E.

Cosmic Rays

Green Corona — E. Limb 7 days earlier: NE- no data SE no data W. Limb 7 days later: NW- no data SW- no data

Indices — Rz: 45 10 cm flux: 81 Flare: 5/23.8 Ca: 15.7 Ip: 0 Ia: 1

Solar Regions — 14863 N20 (14879) N18

Sunspots — (19813) N20 (np)3; 19816 N20 (bf)3 CMP July 23

July 25, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES — 1n/74

Bursts: cm, dm, m, Dkm

SID

X-Rays

Ap 5 05 — Kp: 2- 1+ 1+ 1o 1+ 1- 1- 2o

sc

Aurora: USSR, W.E.

Cosmic Rays

Green Corona — E. Limb 7 days earlier: NE- no data SE- no data — W. Limb 7 days later: NW- no data SW- no data

Indices — Rz: 38 10cm flux: 83 Flare: 39/24.0 Ca: 20.9 Ip: 0 Ia: 0

Solar Regions

Sunspots

July 26, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm ||, dm ||, m, Dkm

SID

X-Rays

Ap 3 01 — Kp: 1- 1o 0+ 1- 1o 1+ 1- 0+

sc

Aurora: USSR, W.E.

Cosmic Rays

Green Corona — E. Limb 7 days earlier: NE- moderately bright SE — W. Limb 7 days later: NW- no data SW- no data

Indices — Rz: 41 10cm flux: 83 Flare: 10/22.7 Ca: 16.4 Ip: 0 Ia: 0

Solar Regions — (14865) S26 14875 S30 (14884) N22

Sunspots — 19819 S30 (ap)3

July 27, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm |, dm |, m, Dkm

SID

X-Rays

Ap 3 02 — Kp: 0o 1- 1o 0+ 1o 0+ 0+ 2-

sc

Aurora: USSR, W.E.

Cosmic Rays

Green Corona — E. Limb 7 days earlier: NE- moderately bright SE- — W. Limb 7 days later: NW- no data SW- no data

Indices — Rz: 34 10cm flux: 83 Flare: 17/23.5 Ca: 17.8 Ip: 0 Ia: 0

Solar Regions — 14866 N19 (2) (14877) N36

Sunspots — 19815 N16 (ap)4 CMP July 26
(19820) N21 (af)2

July 28, 1977 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24

FLARES

Bursts: cm, dm, m ||| ← noise storm, Dkm

SID

X-Rays

Ap 4 03 — Kp: 1o 1o 0+ 1- 1o 1+ 1o 1+

sc

Aurora: USSR, W.E.

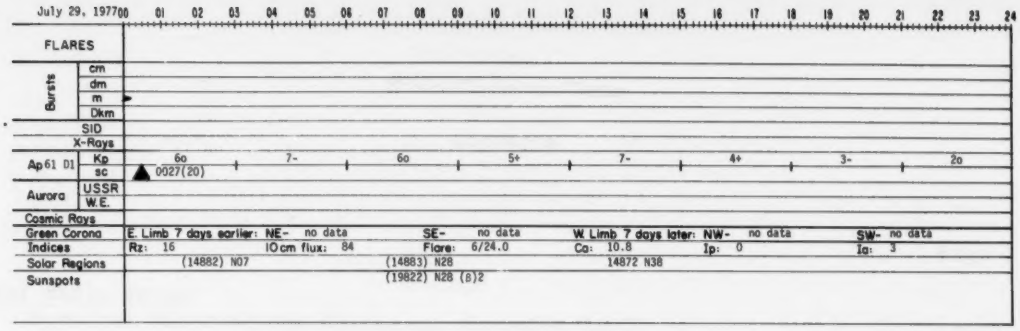
Cosmic Rays

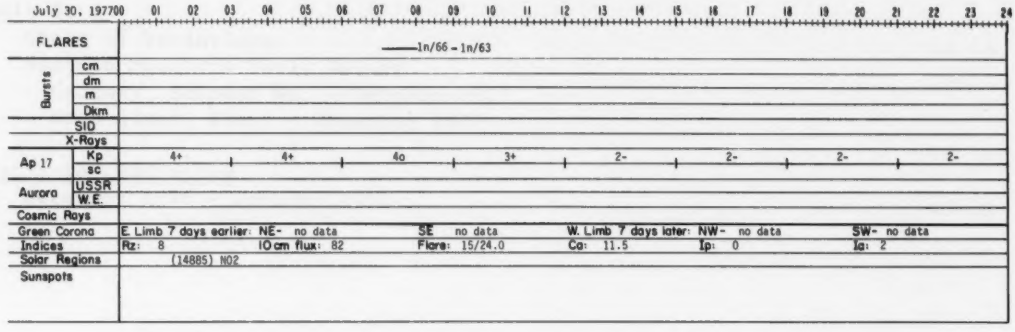
Green Corona — E. Limb 7 days earlier: NE- no data SE no data — W. Limb 7 days later: NW- no data SW- no data

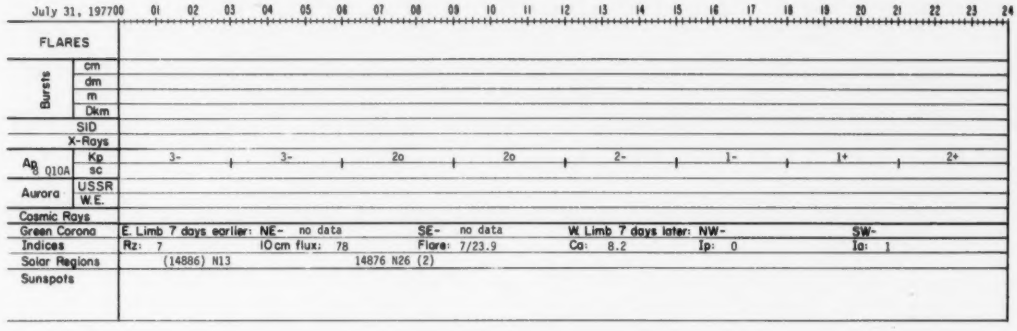
Indices — Rz: 26 10cm flux: 85 Flare: 3/20.9 Ca: 17.5 Ip: 0 Ia: 0

Solar Regions — (14873) S03 14874 S25

Sunspots — (19817) S24 (ßp)3 CMP July 27
(19821) S26 (af)3







REGIONAL FLARE INDEX
INCLUDES ALL FLARES

HC MATH PLAGE NO.	LAT	CMP DATE	DATE FIRST FLARE	DATE LAST FLARE	FLARE-INDEX SUM	FLARE-INDEX MEAN	TOTAL NO. OF FLARES
14829	N23	77/07/03.6	77/06/30	77/06/30	1.90	1.90	1
14841	N23	77/07/03.7	77/07/06	77/07/10	60.66	12.13	32
14849	N25	77/07/04.8	77/07/10	77/07/10	1.69	1.69	2
14835	N19	77/07/08.9	77/07/03	77/07/14	7.33	.61	9
14838	S20	77/07/10.8	77/07/04	77/07/16	38.23	2.94	13
14860	S26	77/07/17.8	77/07/23	77/07/23	.85	.85	1
14855	S23	77/07/22.6	77/07/29	77/07/29	.84	.84	1
14863	N21	77/07/24.8	77/07/19	77/07/30	39.28	3.27	24
14866	N19	77/07/27.5	77/07/19	77/07/30	11.19	.93	2
14874	S24	77/07/28.5	77/07/21	77/08/03	59.05	4.22	25
14883	N28	77/07/29.3	77/07/31	77/08/03	9.95	2.49	5
14872	N38	77/07/29.7	77/07/21	77/07/26	2.86	.48	2
14876	N24	77/07/31.1	77/07/26	77/07/31	4.26	.71	2

Note:
Because of differences in method of calculation, the dates of Central Meridian Passage for the McMath Plage Regions vary somewhat from those given elsewhere. Any region not listed here produced no flares during its disk passage.

Miscellaneous Data

Contents

	Page
Solar Radio Waves	
Spectral Observations Weissenau, November 1977	42-43
Cosmic Rays	
Chart of Variations	44-46
Neutron Monitors Daily Values	47
Calgary, Sulphur Mt. - October 1977	
Deep River, Alert - November 1977	
Solar X-ray Radiation	
December 1976 - January 1977	48-68

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

NOVEMBER 1977

NOV 1977	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
01	0644	1011	WEIS				0647.8	0649.5	1				IIIG
			WEIS				0736.1	0737.0	2				IIIG
	1240	1528	WEIS				0808.7	0808.8	1				IIIB
	1143	1212	WEIS										
02	0750	1525	WEIS										
03	0647	0715	WEIS										
	0731	1524	WEIS				0924.0	1027.0	2				IS
04	0648	1521	WEIS				1414.5	1414.7	1				IIIG
05	0650	1049	WEIS										
	1120	1214	WEIS										
	1231	1521	WEIS										
06	0653	1549	WEIS										
07	0654	1016	WEIS				0755.0	0814.0	1				IS
	1113	1437	WEIS										
08	0713	0810	WEIS										
	0820	1516	WEIS				1215.9	1216.3	2				IIIG
09	0657	0916	WEIS										
	0931	1515	WEIS										
10	0700	1055	WEIS										
	1102	1513	WEIS										
11	0700	1542	WEIS				0705.0	0709					DC
			WEIS				1032.0	1038.7	1				IIIG
			WEIS				1041.5	1041.7	1				IIIG
12	0703	1445	WEIS				0758.8	1759.7	1				IIIG
13	1049	1509	WEIS										
14	0706	1507	WEIS										
15	0708	1508	WEIS										
17	0730	1340	WEIS				1019.7	1019.9	1				IIIG
			WEIS				1021.9	1022.1	1				IIIG
	1351	1528	WEIS										
18	0849	1502	WEIS				0933.0	1450.0	3				IS
19	0713	1140	WEIS				0803.9	0804.6	2				IIIG
			WEIS				0812.5	0813.8	3				IIIG
			WEIS				0818.7	0819.4	2				IIIG
			WEIS				0914.0	0915.7	2				IIIG
			WEIS				0946.7	0941.5	2				IIIG
			WEIS				1041.4	1041.6	1				IIIG
			WEIS				1117.0	1117.4	1				IIIG
			WEIS				1133.0	1133.4	1				IIIG
			WEIS				1133.1	1134.7	2				IIIG
	1152	1455	WEIS				1334.1	1334.5	1				III
20	0715	0933	WEIS										
	1052	1500	WEIS										
21	0718	1459	WEIS										
22	0720	1457	WEIS				1001.7	1045.0	3				IV, RS
			WEIS				1039.7	1040.9	1				IIIG
23	0721	1015	WEIS										
24	0755	1455	WEIS										

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

NOVEMBER 1977

NOV 1977	TIMES OF OBSERVATION		STATION	EVENTS									SPECTRAL TYPE
				DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT	START UT	END UT	INT	START UT	END UT	INT	
25	0723	1454	WEIS										
26	0726	0836	WEIS										
	0922	1453	WEIS										
27	0727	1451	WEIS				1114.2	1117.3	1				IIIG
28	0737	1451	WEIS										
29	0803	1451	WEIS				1151.3	1151.6	1				IIIB
			WEIS				1350.0	1351.6	1				IIIG

The symbols used in connection with the spectral type in describing the important bursts are as follows:

B = Single burst
G = Small group (< 10) of bursts
GG = Large group (> 10) of burst
C = Underlying continuum (particularly with type I)
S = Storm in the sense of intermittent but apparently connected activity
N = Intermittent activity in this period
U = U-shaped burst of Type III
RS = Reverse slope burst
DP = Drifting pairs
DC = Drifting Chains
H = Herringbone
W = Weak
P = Pulsations
CONT = Continuum
UNCLF = Unclassified activity

COSMIC RAY INDICES

(Neutron Monitors)

OCT-NOV 1977

OCT. 1977	SULPHUR MT Average cts/hr	CALGARY Average cts/hr	NOV. 1977	ALERT Average cts/hr	DEEP RIVER Average cts/hr
1	* -	11868.2	1	7451.5	7012.7
2	-	11858.1	2	7487.0	7026.3
3	-	11919.0	3	7496.8	7025.6
4	-	11977.2	4	7519.6	7046.3
5	-	11988.0	5	7562.4	7117.3
6	-	12029.8	6	7581.9	7112.1
7	-	12102.0	7	7588.8	7134.9
8	-	12162.4	8	7604.1	7144.9
9	-	12183.2	9	7647.8	7163.5
10	-	12106.4	10	7660.7	7185.5
11	-	12134.6	11	7557.7	7153.0
12	-	11952.2	12	7600.0	7186.5
13	-	11952.9	13	7603.6	7179.7
14	-	11960.0	14	7523.9	7117.2
15	-	11931.0	15	7478.3	7063.8
16	-	11968.1	16	7478.5	7064.3
17	-	11997.9	17	7499.2	7094.0
18	-	11976.4	18	7530.3	7118.3
19	-	11984.5	19	7515.0	7097.0
20	-	12022.6	20	7525.8	7090.3
21	8978.2(7)	12030.3(21)	21	7504.1	7061.2
22	8987.4	12029.3	22	7630.8	7204.3
23	9039.9	12022.4	23	7523.7	7069.4
24	9049.0	12093.6	24	7518.3	7070.1
25	9115.2	12136.4	25	7509.1	7079.6
26	9167.8	12205.4	26	7475.2	7050.1
27	9080.4	12113.7	27	7436.7	6994.2
28	9028.9	12037.7	28	7413.0	6966.1
29	9035.6	12044.4	29	7455.5	6965.0
30	9003.1	12053.7	30	7451.9	6974.2
31	9038.1	12051.9			
MEAN	9047.6	12028.8	MEAN	7527.7	7085.6

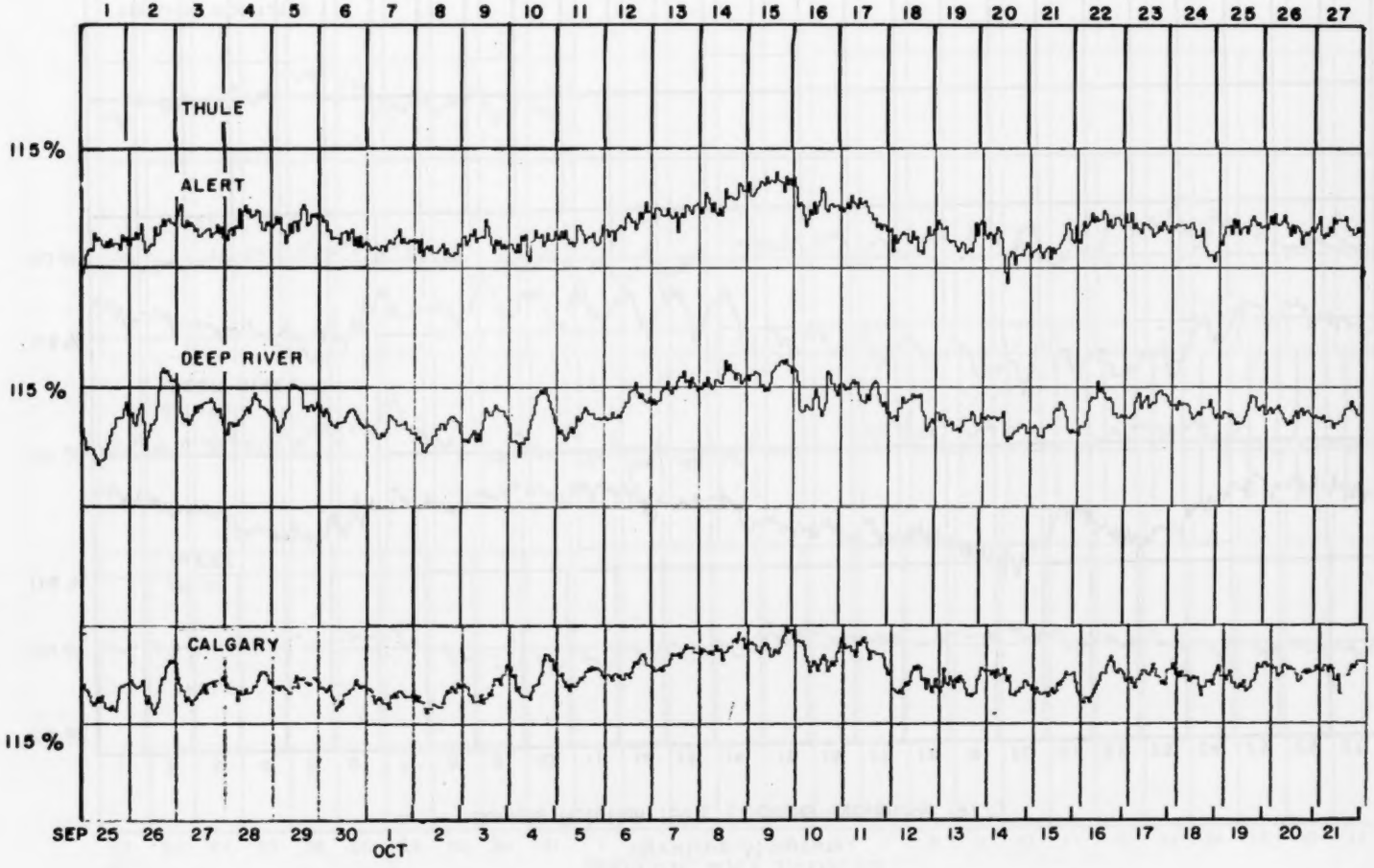
* Due to mechanical and paper punch difficulties, no data are available for the Sulphur Mt. Super Neutron Monitor until 21 October 1977.

( ) Number of hours for which data are available if less than 24. Number of Section Hours at Climax if sum of both sections is less than 40 hours.

Thule, Alert, Calgary, Sulphur Mountain, Kiel and Climax Scaling Factors = 100.
Deep River Scaling Factor = 300.

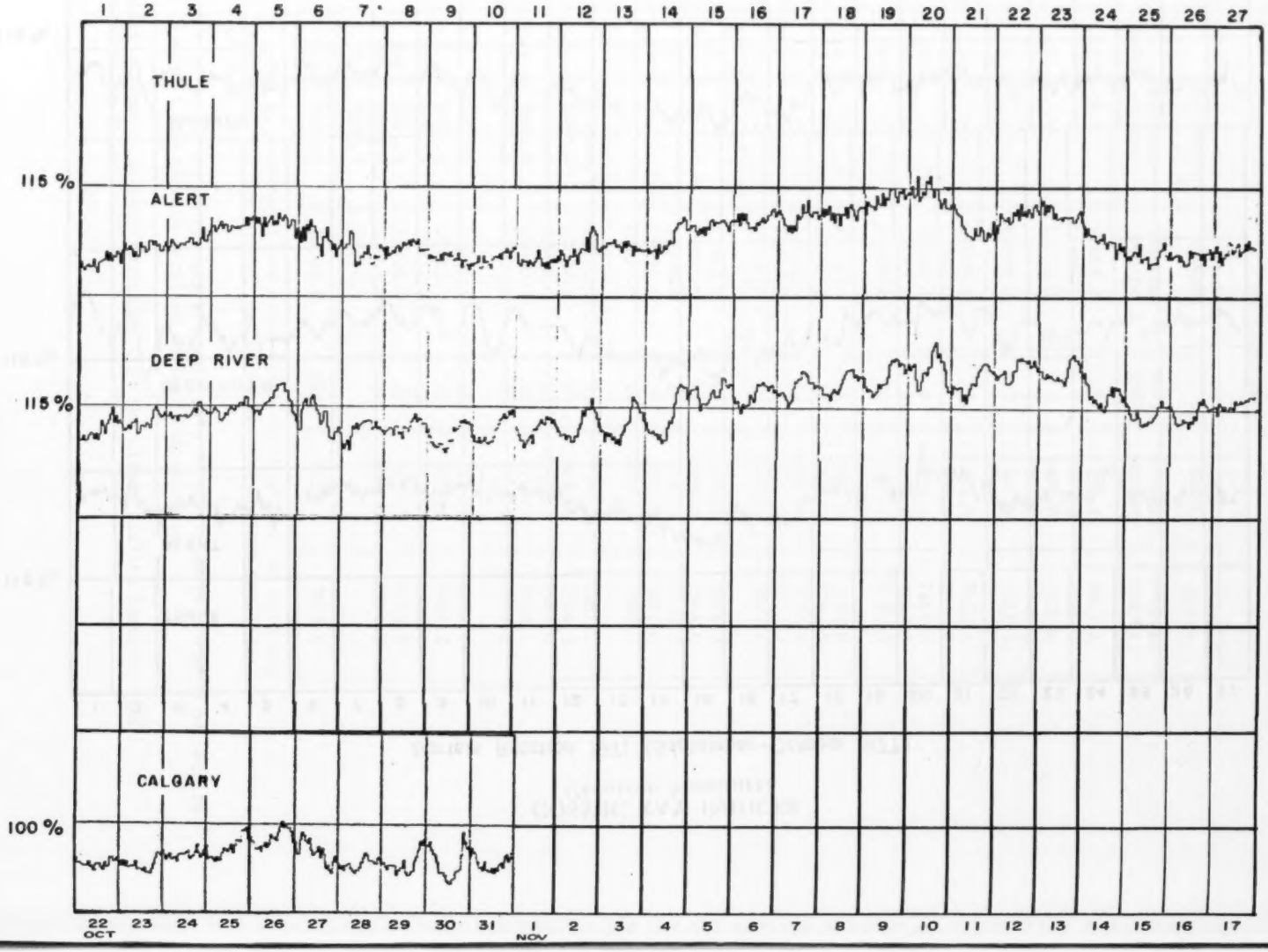
COSMIC RAY INDICES
(Neutron Monitors)

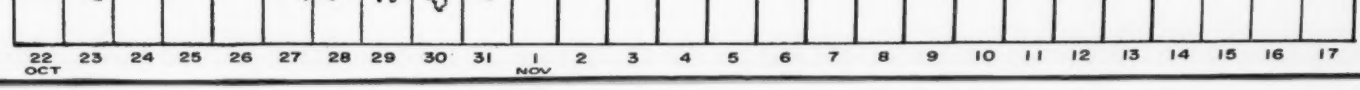
Bartels Rotation 1971 (September - October 1977)



COSMIC RAY INDICES
(Neutron Monitors)

Bartels Rotation 1972 (October - November 1977)

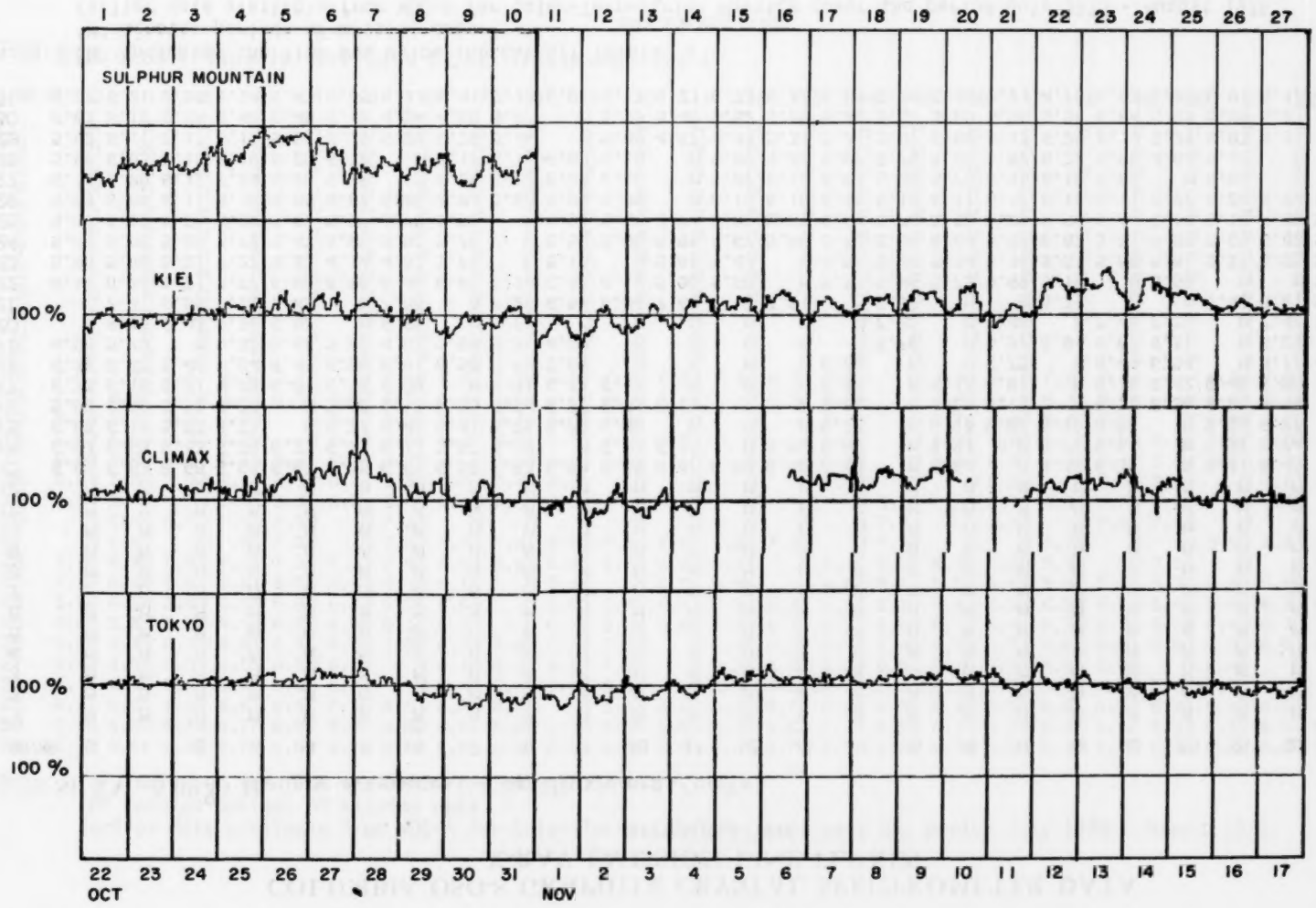




COSMIC RAY INDICES

(Neutron Monitors)

Bartels Rotation 1972 (October - November 1977)



47
Misc
Oct-Nov 77

COLUMBIA OSO-8 GRAPHITE CRYSTAL SPECTROMETER DATA
X-RAY EMISSION LINE FLUXES
DECEMBER 1976

Si XV (5.09Å) Hourly Averages (-Log (flux), ergs/cm² s)

DAY/HR	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
2	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
3	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
4	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
5	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
6	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
7	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
8	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
10	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
11	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
12	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
13	6.64	6.63	6.60	6.65	6.67	6.65	6.69	6.58	6.63	6.50	6.59	6.47	6.59	6.40	6.44	M	6.64	M	6.46	6.39	M	6.41	6.46	M
14	6.63	6.68	6.43	6.30	6.22	6.39	6.13	5.97	5.90	M	6.23	6.15	M	5.98	5.89	M	5.92	M	5.76	5.64	M	5.99	5.74	M
15	6.00	6.15	5.82	5.33	M	5.27	5.44	5.41	5.75	5.79	6.00	M	M	M	5.37	M	6.10	6.06	6.10	6.09	M	5.53	6.27	M
16	5.80	6.08	5.92	6.35	M	5.90	6.17	6.25	6.36	6.22	6.36	6.18	M	M	6.28	M	6.21	6.15	M	6.32	6.34	6.21	6.24	M
17	6.35	6.19	6.31	5.78	6.01	6.16	6.29	M	6.31	6.43	6.17	M	M	M	5.33	M	5.17	6.01	M	6.19	6.42	6.49	6.55	M
18	6.36	6.32	5.46	6.64	6.45	6.58	6.51	6.50	6.54	5.90	M	M	M	M	6.29	M	M	6.75	M	6.44	6.54	M	4.11	4.37
19	4.50	5.09	M	5.32	5.60	5.72	4.63	5.84	5.91	4.29	M	M	M	M	M	5.76	M	5.97	6.04	6.07	6.31	M	6.26	M
20	M	6.05	6.43	6.36	6.82	M	6.85	M	6.77	M	M	M	M	M	M	7.25	M	7.49	B	7.46	7.35	M	7.47	7.93
21	M	7.01	6.95	7.12	7.48	M	7.05	B	7.29	6.53	6.86	7.09	B	7.21	M	6.96	M	M	5.39	M	M	5.49	5.61	5.94
22	6.16	6.54	6.71	6.77	6.82	6.79	6.46	6.01	6.14	6.31	6.12	5.80	5.60	M	5.77	5.46	5.73	5.68	5.10	M	5.58	M	M	5.48
23	5.85	5.98	5.21	5.22	5.33	4.34	4.82	5.72	M	5.19	M	5.86	5.44	M	4.51	5.38	5.24	5.36	5.51	5.08	5.01	5.37	5.55	5.46
24	5.38	5.85	5.69	5.73	5.47	5.85	5.92	5.75	M	5.53	5.88	5.89	5.67	5.90	5.76	5.88	6.04	5.99	6.02	5.81	6.05	5.69	6.02	5.87
25	5.36	5.62	5.66	5.82	5.87	5.77	5.78	5.91	M	5.91	5.66	5.74	6.01	5.85	5.74	5.76	5.96	6.09	5.95	6.14	6.16	6.10	6.08	5.52
26	5.89	6.06	6.11	6.16	6.08	6.07	6.06	6.04	5.82	5.94	5.99	M	6.16	6.10	6.18	6.12	6.11	6.12	6.16	6.11	6.27	6.24	6.24	6.24
27	6.11	6.20	6.12	6.24	6.20	6.20	M	5.89	6.22	6.28	6.12	M	5.67	6.14	6.03	6.06	5.79	6.15	6.10	6.04	M	6.06	M	M
28	5.90	6.03	6.19	6.18	6.25	6.30	M	6.17	6.13	6.09	6.18	M	5.59	5.32	5.87	5.75	5.85	5.87	5.22	4.55	4.84	5.17	M	M
29	5.82	6.11	6.17	6.13	6.21	6.38	6.20	6.26	5.46	M	5.49	4.67	4.93	5.31	5.71	5.87	6.08	6.13	6.20	6.14	6.20	6.03	6.33	M
30	6.03	6.19	6.34	6.42	6.48	5.48	4.54	4.60	4.87	M	5.19	5.48	5.52	5.50	5.60	5.67	5.80	5.90	5.98	6.04	5.95	5.99	6.21	6.26
31	6.27	6.21	6.06	6.34	6.43	6.35	6.33	6.41	6.12	6.01	6.13	6.21	6.32	6.33	6.08	6.20	5.98	5.21	4.78	5.83	6.07	6.01	6.17	4.60

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.
Earlier data available from WDC-A for Solar-Terrestrial Physics cover the period July 1975 - August 1976.

Data are missing for days 1 Jan., 15 April, 11 May, 23 May and 9 June 1977 due to processing problems. These will be published later. Some data published earlier are replaced here by more accurate data.

COLUMBIA OSO-8 GRAPHITE CRYSTAL SPECTROMETER DATA
X-RAY EMISSION LINE FLUXES

DECEMBER 1976

Si XIII (5.68A) Hourly Averages (-Log (flux), ergs/cm^{2}s)

DAY/HR	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
2	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
3	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
4	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
5	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
6	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
7	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
8	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
10	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
11	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
12	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
13	7.13	7.72	7.07	6.96	7.17	B	7.10	7.69	7.25	6.97	7.30	6.81	7.14	6.87	7.00	M	7.03	M	7.02	7.08	M	6.86	7.03	M
14	7.31	6.97	7.06	6.61	6.66	6.93	6.84	6.51	6.63	M	6.85	6.63	M	6.58	6.38	M	6.35	M	6.20	6.05	M	6.43	6.16	M
15	6.38	6.37	6.21	5.73	M	5.72	5.83	5.88	6.15	6.20	6.41	M	M	M	5.78	M	6.51	6.49	6.47	6.52	M	6.00	6.72	M
16	6.23	6.60	6.39	7.39	M	6.30	6.55	6.42	6.92	6.53	7.04	6.55	M	M	6.52	M	6.72	6.60	M	6.82	6.76	6.67	6.80	M
17	6.90	6.49	6.91	6.18	6.46	6.55	6.78	M	6.63	6.83	6.90	M	M	M	5.65	M	5.44	6.39	M	6.47	6.64	6.70	7.20	M
18	6.64	7.04	5.84	7.11	6.96	6.86	6.97	7.09	7.46	6.18	M	M	M	M	6.52	M	M	6.80	M	7.08	7.27	M	4.51	4.82
19	4.94	5.49	M	5.65	5.97	6.25	5.00	6.16	6.63	4.64	M	M	M	M	M	6.21	M	6.19	6.37	6.52	6.63	M	6.60	M
20	M	6.46	6.72	6.58	7.10	M	7.27	M	M	M	M	M	M	M	M	7.01	M	7.37	M	7.25	7.15	M	B	M
21	M	7.62	B	7.96	7.20	M	7.52	7.44	7.41	6.70	7.50	7.82	7.22	7.35	M	7.88	M	M	5.75	M	M	5.89	5.97	6.30
22	6.48	6.90	7.81	7.13	7.99	7.22	7.07	6.43	6.68	6.83	6.70	6.08	5.91	M	6.16	5.85	6.38	6.18	5.54	M	5.96	M	M	5.95
23	6.28	6.40	5.61	5.61	5.70	4.67	5.19	6.16	M	5.56	M	6.26	5.86	M	4.87	5.77	5.54	5.67	5.82	5.39	5.38	5.80	5.88	5.84
24	5.74	6.30	6.09	6.15	5.84	6.17	6.28	6.09	M	5.80	6.45	6.41	6.01	6.32	6.07	6.15	6.51	6.53	6.52	6.14	6.48	5.99	6.22	6.19
25	5.67	5.95	6.02	6.16	6.27	6.08	6.17	6.27	M	6.30	5.94	5.86	6.32	6.11	6.07	6.24	6.16	6.41	6.23	6.44	6.70	6.42	6.35	5.88
26	6.25	6.39	6.39	6.61	6.36	6.44	6.50	6.33	6.09	6.27	6.39	M	6.47	6.40	6.63	6.48	6.53	6.51	6.60	6.51	6.86	6.52	6.51	6.53
27	6.43	6.57	6.51	6.55	6.54	6.54	M	6.17	6.42	6.67	7.27	M	5.96	6.42	6.28	6.51	6.10	6.51	6.46	6.49	M	6.40	M	M
28	6.15	6.36	6.49	6.53	6.50	6.71	M	6.48	6.48	6.47	6.52	M	5.91	5.67	6.19	6.13	6.14	6.24	5.52	4.85	5.17	5.52	M	M
29	6.21	6.55	6.58	6.61	6.57	7.18	6.53	7.01	5.76	M	5.84	4.98	5.27	5.70	6.08	6.38	6.49	6.51	6.61	6.57	6.47	6.48	6.69	M
30	6.36	6.55	6.74	6.77	6.92	5.81	4.88	4.96	5.25	M	5.55	5.85	5.92	5.88	5.98	6.02	6.19	6.28	6.26	6.52	6.33	6.39	6.61	6.72
31	6.77	6.67	6.49	6.79	6.66	6.75	6.62	6.88	6.48	6.49	6.56	6.55	6.63	6.74	6.53	6.66	6.38	5.55	5.10	6.35	6.43	6.38	6.68	5.00

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.
Earlier data available from WDC-A for Solar-Terrestrial Physics cover the period July 1975 - August 1976.

COLUMBIA OSO-8 GRAPHITE CRYSTAL SPECTROMETER DATA
X-RAY EMISSION LINE FLUXES

DECEMBER 1976

Si XII (5.82Å) Hourly Averages (-Log (flux), ergs/cm^2 s)

DAY/HR	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
2	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
3	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
4	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
5	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
6	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
7	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
8	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
10	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
11	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
12	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
13	6.55	6.52	6.51	6.51	6.50	6.46	6.53	6.49	6.46	6.44	6.47	6.46	6.45	6.45	6.47	M	6.53	M	6.42	6.42	M	6.42	6.38	M
14	6.48	6.58	6.39	6.32	6.35	6.42	6.23	6.19	6.17	M	6.26	6.18	M	6.24	6.09	M	6.03	M	6.10	6.03	M	6.11	5.96	M
15	6.16	6.15	6.08	5.73	M	5.67	5.76	5.73	5.95	6.05	6.10	M	M	M	5.70	M	6.10	6.08	6.08	6.18	M	5.77	6.22	M
16	6.05	6.19	6.12	6.28	M	6.16	6.22	6.23	6.27	6.20	6.28	6.15	M	M	6.19	M	6.17	6.16	M	6.25	6.31	6.21	6.24	M
17	6.32	6.24	6.31	6.07	6.10	6.18	6.26	M	6.30	6.40	6.24	M	M	M	5.66	M	5.52	6.10	M	6.12	6.28	6.37	6.32	M
18	6.30	6.34	5.93	6.44	6.48	6.52	6.32	6.33	6.50	6.11	M	M	M	M	6.22	M	M	6.43	M	6.41	6.34	M	4.79	4.96
19	5.08	5.49	M	5.62	5.79	5.84	5.27	5.91	6.04	4.89	M	M	M	M	M	5.93	M	6.06	6.18	6.31	6.34	M	6.36	M
20	M	6.18	6.31	6.40	6.57	M	6.66	M	6.51	M	M	M	M	M	M	6.68	M	6.71	6.92	6.71	6.81	M	6.93	6.70
21	M	6.80	6.70	6.80	6.90	M	6.73	6.78	6.60	6.50	6.58	6.64	6.91	6.77	M	6.85	M	M	5.83	M	M	5.71	5.77	6.00
22	6.17	6.40	6.54	6.58	6.65	6.76	6.53	6.20	6.16	6.29	6.28	6.06	5.79	M	5.91	5.86	5.89	5.92	5.56	M	5.84	M	M	5.71
23	5.95	6.07	5.72	5.59	5.64	4.85	5.20	5.81	M	5.44	M	5.90	5.70	M	5.02	5.59	5.48	5.61	5.68	5.42	5.37	5.60	5.80	5.70
24	5.55	5.87	5,82	5.84	5.67	5.89	5.93	5.89	M	5.83	5.91	5.94	5.80	5.88	5.79	5.86	5.94	6.03	5.92	5.93	6.01	5.83	5.89	5.98
25	5.68	5.79	5.77	5.85	5.87	5.85	5.79	5.91	M	5.89	5.74	5.86	5.90	5.90	5.93	5.86	5.94	6.02	5.95	6.03	5.98	6.02	6.00	5.76
26	5.84	5.94	6.05	6.05	6.03	5.98	6.08	5.96	6.02	5.97	6.02	M	6.06	6.06	6.05	6.03	6.04	6.06	6.08	6.08	6.14	6.07	6.11	6.11
27	6.05	6.10	6.04	6.09	6.10	6.07	M	5.97	6.03	6.07	6.05	M	5.88	6.03	5.96	6.07	5.86	6.00	6.05	5.98	M	5.95	M	M
28	5.86	5.98	6.05	6.05	6.10	6.14	M	6.08	6.03	5.99	6.04	M	5.89	5.59	5.93	5.87	5.94	5.94	5.73	5.02	5.19	5.40	M	M
29	5.84	5.95	6.00	6.01	6.02	6.20	6.09	6.13	5.92	M	5.71	5.16	5.32	5.54	5.85	5.98	6.07	6.11	6.07	6.04	6.13	6.07	6.20	M
30	6.11	6.17	6.27	6.26	6.34	5.90	5.12	5.15	5.31	M	5.57	5.74	5.79	5.74	5.78	5.82	5.89	5.96	6.02	6.03	5.99	6.03	6.11	6.15
31	6.13	6.18	6.05	6.19	6.26	6.22	6.19	6.32	6.15	6.02	6.12	6.16	6.22	6.25	6.12	6.19	6.13	5.50	5.30	5.88	6.14	6.11	6.27	5.31

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.
Earlier data available from WDC-A for Solar-Terrestrial Physics cover the period July 1975 - August 1976.

COLUMBIA OSO-8 GRAPHITE CRYSTAL SPECTROMETER DATA
X-RAY EMISSION LINE FLUXES

JANUARY 1977

Si XV (5.09Å) Hourly Averages (-Log (flux), ergs/cm² s)

DAY/HR	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
2	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
3	5.84	5.91	5.48	5.73	5.72	5.73	6.11	6.13	6.09	6.33	6.26	6.21	6.13	6.26	6.31	5.56	6.38	6.23	6.44	6.47	6.05	6.26	6.30	M
4	6.18	6.02	6.37	6.24	6.28	6.55	6.37	6.07	6.17	6.21	M	5.89	4.76	4.75	5.07	5.33	5.41	5.46	5.60	5.65	5.82	5.83	5.96	M
5	6.09	6.27	6.41	6.42	6.31	M	6.01	6.36	6.10	6.16	M	6.03	6.31	6.17	6.05	6.10	6.21	6.39	6.26	6.11	6.35	6.43	6.09	6.39
6	6.04	6.18	6.15	6.01	6.08	6.23	6.01	6.21	M	M	6.30	6.44	M	M	6.44	6.47	6.39	6.61	6.58	6.55	6.58	6.60	6.59	6.67
7	M	6.76	M	M	6.94	M	M	M	M	M	M	M	6.86	M	6.98	6.75	6.99	7.04	7.47	M	7.17	7.61	M	7.10
8	M	M	M	7.78	7.06	7.40	7.42	7.25	M	7.22	7.53	M	7.49	7.31	M	M	7.35	M	7.55	M	M	M	M	7.54
9	M	M	6.94	M	7.34	M	M	6.98	M	M	M	M	B	7.88	M	7.40	7.30	M	M	M	M	7.23	M	M
10	7.21	M	M	M	7.19	M	M	M	M	M	M	M	M	7.44	M	M	M	M	M	M	M	M	M	M
11	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	6.58	M	M	5.95	6.83	M	M	5.72	M
12	6.45	6.36	5.99	7.09	M	6.46	M	M	5.85	M	5.64	M	M	M	M	M	M	M	M	M	M	M	M	M
13	M	M	M	M	M	M	6.01	M	M	M	M	M	5.98	5.87	M	6.00	M	M	M	6.05	M	6.06	6.34	6.11
14	6.08	6.05	5.96	6.14	M	5.80	6.23	6.25	6.40	6.25	6.31	5.92	6.44	6.27	6.21	5.91	6.25	6.18	6.33	6.29	6.18	6.09	6.10	6.27
15	6.03	6.35	6.31	5.81	6.07	6.17	6.17	M	6.02	5.99	6.01	6.14	6.15	6.12	5.94	5.62	5.82	6.07	5.89	5.63	5.98	6.09	5.96	5.83
16	5.71	5.78	5.98	5.97	5.79	5.93	5.79	5.84	5.15	5.71	5.81	5.87	5.96	5.99	5.96	5.80	5.78	5.76	5.83	6.00	5.86	5.59	5.89	5.96
17	5.99	5.74	5.84	5.81	5.43	5.60	5.85	6.11	5.97	5.85	5.79	5.67	5.56	5.77	5.80	5.96	5.97	5.80	5.51	5.67	5.68	5.74	5.65	M
18	5.55	5.40	5.30	5.33	5.33	5.54	5.44	5.02	5.37	5.70	5.59	M	M	M	M	M	M	M	M	M	M	M	M	M
19	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
20	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
21	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
22	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
23	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
24	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
25	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
26	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
27	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
28	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
29	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
30	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
31	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.
Earlier data available from WDC-A for Solar-Terrestrial Physics cover the period July 1975 - August 1976.

COLUMBIA OSO-8 GRAPHITE CRYSTAL SPECTROMETER DATA
X-RAY EMISSION LINE FLUXES
JANUARY 1977

Si XIII (5.68A) Hourly Averages (-Log (flux), ergs/cm^{2}s)

DAY/HR	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	6.04
2	5.92	6.35	M	6.52	7.39	6.38	6.63	M	6.62	5.72	5.39	5.79	4.99	5.24	5.99	6.04	5.83	6.73	5.93	5.78	6.53	6.77	6.03	6.34
3	6.35	6.39	5.91	6.16	6.18	6.21	6.58	6.43	6.62	6.82	6.47	6.79	7.41	6.63	6.80	6.10	6.71	6.90	7.12	7.16	6.60	6.68	7.25	M
4	B	6.50	6.99	6.60	6.73	7.06	6.84	6.48	6.67	6.80	M	6.25	5.17	5.13	6.68	5.81	5.87	5.90	6.09	6.11	6.36	6.32	6.44	M
5	6.72	6.68	6.90	6.87	6.65	M	6.45	7.16	6.52	6.59	M	6.38	6.81	6.57	6.49	6.49	6.70	6.79	7.15	6.58	7.03	6.90	6.61	6.76
6	6.47	6.57	6.62	6.53	6.40	6.97	6.44	6.52	M	M	6.64	6.91	M	M	7.05	6.97	7.01	7.01	7.13	6.95	7.32	7.35	6.97	6.99
7	M	7.02	M	M	7.67	M	M	M	M	M	M	M	7.82	M	7.51	7.43	7.23	7.59	7.13	M	7.30	8.00	M	7.40
8	M	M	M	M	7.37	7.16	M	7.10	M	7.95	M	M	7.48	M	M	M	7.12	M	7.95	M	M	M	M	M
9	M	M	6.86	M	7.03	M	M	M	M	M	M	M	M	6.97	M	7.91	7.56	M	M	M	M	M	M	M
10	7.86	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	6.70	M	M
11	M	5.36	M	M	M	M	M	M	M	M	M	M	M	M	M	6.43	M	M	M	6.28	M	M	5.74	M
12	6.13	6.27	5.88	6.52	M	6.93	M	M	6.01	M	6.26	M	M	M	M	M	M	M	M	M	M	M	M	M
13	M	M	M	M	M	M	6.24	M	M	M	M	M	6.37	6.35	M	6.10	M	M	M	6.45	M	6.44	6.64	6.44
14	6.45	6.23	6.41	6.72	M	6.00	6.83	6.55	7.23	6.56	6.58	6.21	6.67	6.68	7.00	6.16	6.67	6.64	6.62	6.65	6.71	6.37	6.30	7.39
15	6.42	6.65	7.05	6.12	6.37	6.60	6.49	M	6.37	6.37	6.44	6.48	6.58	6.59	6.27	5.95	6.16	6.40	6.34	6.04	6.30	6.49	6.31	6.18
16	6.02	6.15	6.34	6.35	6.16	6.37	6.14	6.19	5.41	6.09	6.15	6.24	6.38	6.37	6.32	6.15	6.09	6.16	6.17	6.36	6.24	5.96	6.31	6.38
17	6.45	6.05	6.20	6.17	5.72	5.98	6.20	6.59	6.29	6.19	6.06	5.97	5.95	6.11	6.17	6.33	6.48	6.12	5.87	6.02	6.07	6.09	6.08	M
18	5.89	5.78	5.69	5.72	5.74	5.92	5.83	5.45	5.82	6.07	5.92	M	M	M	M	M	M	M	M	M	M	M	M	M
19	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
20	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
21	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
22	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
23	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
24	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
25	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
26	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
27	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
28	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
29	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
30	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
31	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.
Earlier data available from WDC-A for Solar-Terrestrial Physics cover the period July 1975 - August 1976.

COLUMBIA OSO-8 GRAPHITE CRYSTAL SPECTROMETER DATA
X-RAY EMISSION LINE FLUXES
JANUARY 1977

Si XII (5.82Å) Hourly Averages (-Log (flux), ergs/cm^2 s)

DAY/HR	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	6.21
2	6.12	6.33	6.06	6.10	6.44	6.43	6.01	M	6.20	6.04	6.08	6.21	6.02	6.02	6.16	6.12	6.09	6.10	6.16	6.13	6.04	5.88	5.97	6.19
3	6.05	6.11	5.81	5.89	5.93	5.82	6.16	6.23	6.16	6.20	6.23	6.22	6.15	6.18	6.24	6.00	6.32	6.22	6.32	6.34	6.20	6.17	6.25	M
4	6.08	6.16	6.31	6.24	6.29	6.32	6.33	6.17	6.25	6.24	M	6.12	5.35	5.31	5.44	5.71	5.76	5.81	5.86	5.91	6.01	6.04	6.09	M
5	6.15	6.26	6.43	6.34	6.31	M	6.17	6.35	6.27	6.18	M	6.07	6.26	6.20	6.21	6.22	6.20	6.29	6.31	6.23	6.34	6.43	6.27	6.32
6	6.17	6.22	6.38	6.18	6.19	6.33	6.17	6.29	M	M	6.26	6.44	M	M	6.40	6.40	6.43	6.42	6.36	6.42	6.43	6.44	6.42	6.45
7	M	6.60	M	M	6.57	M	M	M	M	M	M	M	6.76	M	6.76	6.64	6.77	6.64	6.76	M	6.97	6.86	M	7.04
8	M	M	M	6.75	7.04	7.04	6.80	6.70	M	6.87	7.39	M	7.13	6.83	M	M	6.75	M	6.63	M	6.53	M	M	6.62
9	M	M	6.79	M	6.61	M	M	6.20	M	M	M	M	6.64	6.56	M	6.87	6.96	M	M	M	M	6.85	M	M
10	6.10	M	M	M	5.97	M	M	M	M	M	M	M	M	6.49	M	M	M	M	M	M	M	4.81	M	M
11	M	4.80	M	M	M	M	M	M	M	M	M	M	M	M	M	5.73	M	M	5.46	5.64	M	M	4.34	M
12	5.44	5.85	5.50	6.23	M	6.57	M	M	6.00	M	5.84	M	M	M	M	M	M	M	M	M	M	M	M	M
13	M	M	M	M	M	M	5.92	M	M	M	M	M	6.12	6.31	M	6.04	M	M	M	6.25	M	6.22	6.47	6.31
14	6.27	6.20	6.22	6.35	M	6.07	6.25	6.36	6.40	6.32	6.44	6.36	6.37	6.38	6.37	6.18	6.51	6.54	6.28	6.39	6.35	6.34	6.16	6.36
15	6.34	6.40	6.47	6.13	6.18	6.27	6.26	M	6.17	6.10	6.05	6.15	6.20	6.14	6.06	5.83	5.94	6.11	6.06	5.85	6.12	6.12	6.07	6.04
16	5.92	5.98	6.04	6.04	5.98	5.99	5.93	6.00	5.49	5.86	5.88	5.99	6.02	6.03	6.01	5.95	5.94	5.90	5.98	6.06	5.95	5.83	6.01	6.01
17	6.09	5.93	5.99	5.93	5.61	5.70	5.89	6.05	5.98	5.95	5.86	5.85	5.79	5.87	5.92	6.00	6.00	5.89	5.77	5.81	5.87	5.86	5.79	M
18	5.84	5.67	5.57	5.63	5.69	5.78	5.69	5.45	5.63	5.81	5.84	M	M	M	M	M	M	M	M	M	M	M	M	M
19	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
20	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
21	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
22	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
23	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
24	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
25	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
26	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
27	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
28	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
29	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
30	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
31	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.
Earlier data available from WDC-A for Solar-Terrestrial Physics cover the period July 1975 - August 1976.

COLUMBIA OSO-8 GRAPHITE CRYSTAL SPECTROMETER DATA
X-RAY EMISSION LINE FLUXES

FEBRUARY 1977

Si XV (5.09Å) Hourly Averages (-Log (flux), ergs/cm² s)

DAY/HR	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
2	M	5.98	M	M	M	M	M	M	M	5.22	M	M	M	M	5.39	5.29	M	M	5.84	M	5.59	6.24	5.81	M
3	6.05	M	M	5.91	M	M	M	M	M	5.91	6.15	5.53	6.17	M	M	M	5.87	M	M	M	M	5.84	M	4.82
4	M	M	M	M	5.34	5.53	M	5.78	5.80	5.74	M	5.92	M	6.28	M	6.27	M	M	M	6.27	6.37	M	M	6.21
5	6.53	6.29	6.38	M	6.27	6.73	6.24	6.52	6.28	M	6.35	6.15	M	6.56	6.22	M	M	5.94	M	6.32	M	6.41	M	6.41
6	M	6.32	M	M	6.57	6.20	M	6.32	6.62	M	6.58	6.53	M	M	6.57	6.01	6.26	M	6.58	6.58	6.49	6.59	M	6.43
7	6.49	6.39	6.42	6.64	6.60	6.49	6.69	6.52	6.56	6.30	6.28	6.58	6.47	6.29	6.61	6.44	6.34	M	6.30	5.92	5.91	6.31	5.67	5.76
8	5.86	6.01	5.79	5.80	5.52	5.66	5.71	5.62	5.86	5.80	6.00	5.56	6.24	5.71	5.32	M	5.23	5.68	5.61	4.74	M	5.21	4.96	5.44
9	5.26	5.41	5.16	5.48	5.41	5.51	5.50	5.48	5.60	5.40	5.64	5.58	5.08	5.68	5.66	4.87	5.37	5.60	5.67	5.37	5.42	5.56	5.36	5.51
10	5.97	5.63	5.67	5.89	5.88	5.95	5.75	5.94	5.68	5.89	5.71	5.45	5.57	5.70	5.32	5.66	5.62	5.57	5.69	5.43	5.85	5.63	5.52	5.52
11	5.21	5.04	4.82	5.27	5.53	5.46	5.42	5.63	5.43	5.36	5.78	M	M	M	M	M	M	M	M	M	M	M	M	M
12	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
13	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
14	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
15	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
16	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
17	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
18	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
19	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
20	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
21	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
22	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
23	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
24	M	M	M	M	M	M	M	M	M	M	M	5.36	5.48	5.75	5.96	6.09	6.30	6.41	6.51	6.58	6.63	6.73	6.76	6.84
25	6.84	6.88	6.85	6.89	6.97	6.94	6.97	7.07	7.07	M	6.98	6.89	6.95	7.12	7.10	7.14	7.18	7.18	7.22	7.25	7.11	6.92	6.75	7.00
26	7.13	7.31	7.15	7.09	M	7.05	7.12	7.10	7.15	7.12	7.04	7.06	7.03	7.16	M	M	M	6.91	6.89	6.84	6.61	6.52	6.31	6.77
27	6.86	6.68	6.54	6.15	6.13	6.31	6.52	6.58	6.68	6.79	6.92	7.11	7.08	7.18	7.08	7.31	7.21	7.22	7.16	7.20	7.51	7.01	7.23	7.07
28	6.98	7.01	6.72	6.30	6.52	6.41	6.68	M	6.72	M	6.71	7.13	7.05	6.98	7.06	7.06	7.01	6.62	6.60	6.83	5.83	M	4.10	4.89

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.
Earlier data available from WDC-A for Solar-Terrestrial Physics cover the period July 1975 - August 1976.

COLUMBIA OSO-8 GRAPHITE CRYSTAL SPECTROMETER DATA
X-RAY EMISSION LINE FLUXES

FEBRUARY 1977

Si XIII (5.68A) Hourly Averages (-Log (flux), ergs/cm^{2}s)

DAY/HR	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
2	M	5.51	M	M	M	M	M	M	M	5.45	M	M	M	M	5.73	5.47	M	M	6.19	M	5.90	6.70	6.12	M
3	M	M	M	5.97	M	M	M	M	M	5.99	6.11	M	6.23	M	M	M	M	M	M	M	M	5.61	M	6.02
4	M	M	M	M	M	M	M	M	M	5.93	M	5.81	M	5.93	M	M	M	M	M	6.03	6.04	M	M	6.25
5	5.95	5.56	6.68	M	6.03	6.30	5.68	6.13	5.77	M	5.98	5.77	M	6.16	5.65	M	M	5.67	M	5.60	M	5.94	M	5.79
6	M	5.68	M	M	5.71	5.94	M	6.17	6.21	M	M	7.31	7.17	M	6.49	6.36	6.50	M	6.99	6.63	7.05	6.64	M	B
7	7.05	6.73	6.80	6.72	7.46	7.29	7.08	6.97	7.27	6.74	6.90	7.03	7.11	6.59	6.86	B	6.93	M	6.87	6.39	6.33	6.74	6.13	6.17
8	6.43	6.56	6.24	6.35	6.08	6.16	6.25	6.22	6.34	6.51	6.66	6.09	6.78	6.25	5.93	M	5.77	6.35	6.21	5.19	M	5.68	5.36	5.86
9	5.71	5.89	5.64	5.96	5.84	5.96	5.93	5.91	6.07	5.83	6.05	6.11	5.51	6.12	6.16	5.29	5.82	6.06	6.09	5.77	5.89	6.01	5.84	5.94
10	6.48	5.97	6.02	6.35	6.30	6.29	6.14	6.23	6.03	6.39	6.14	5.80	5.96	6.07	5.69	6.11	6.00	5.88	6.01	5.79	6.27	6.02	5.91	5.86
11	5.61	5.46	5.17	5.65	5.92	5.83	5.84	6.01	5.78	5.70	6.27	M	M	M	M	M	M	M	M	M	M	M	M	M
12	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
13	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
14	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
15	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
16	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
17	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
18	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
19	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
20	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
21	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
22	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
23	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
24	M	M	M	M	M	M	M	M	M	M	M	5.85	5.91	6.23	6.40	6.53	6.87	6.86	7.21	B	6.99	7.58	6.85	6.28
25	7.12	7.29	7.18	7.24	7.35	7.59	7.42	B	7.37	M	7.83	7.35	B	7.65	7.52	7.96	7.48	7.85	7.34	7.47	7.41	7.55	7.33	7.22
26	7.65	7.41	M	7.54	M	7.43	B	7.55	7.80	M	B	7.65	B	7.90	M	M	M	7.15	7.12	7.77	7.30	6.95	7.08	7.46
27	7.28	7.16	6.77	6.42	6.51	6.72	7.07	7.13	7.13	7.10	B	7.61	7.65	7.79	7.35	7.36	7.48	7.92	7.35	7.23	7.55	7.50	7.65	7.68
28	7.49	7.78	B	6.89	7.23	7.04	7.15	M	7.22	M	7.31	7.61	7.91	B	7.56	B	7.60	7.10	7.37	7.48	6.05	M	4.44	5.29

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.
Earlier data available from WDC-A for Solar-Terrestrial Physics cover the period July 1975 - August 1976.

COLUMBIA OSO-8 GRAPHITE CRYSTAL SPECTROMETER DATA
X-RAY EMISSION LINE FLUXES

FEBRUARY 1977

Si XII (5.82Å) Hourly Averages (-Log (flux), ergs/cm^2 s)

DAY/HR	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
2	M	5.85	M	M	M	M	M	M	M	5.30	M	M	M	M	5.35	5.35	M	M	5.95	M	5.44	5.70	5.97	M
3	5.54	M	M	5.85	M	M	M	M	M	5.73	5.93	4.53	5.83	M	M	M	M	M	M	M	M	5.24	M	5.04
4	M	M	M	M	5.14	5.07	M	5.26	5.37	5.16	M	5.31	M	5.21	M	4.67	M	M	M	4.84	5.68	M	M	5.20
5	5.80	5.46	3.66	M	5.26	5.21	6.14	5.33	3.24	M	5.20	5.21	M	5.48	5.11	M	M	M	M	4.80	M	5.50	M	4.61
6	M	M	M	M	M	5.74	M	5.55	5.53	M	5.96	6.04	5.96	M	6.35	6.22	6.17	M	6.38	6.34	6.33	6.40	M	6.37
7	6.39	6.29	6.38	6.32	6.40	6.37	6.37	6.35	6.40	6.28	6.24	6.33	6.30	6.23	6.34	6.39	6.32	M	6.25	6.14	6.05	6.21	5.92	5.97
8	6.01	6.07	6.00	6.04	5.87	5.95	5.88	5.92	6.06	6.00	6.15	5.90	6.20	6.00	5.77	M	5.68	6.01	5.97	5.20	M	5.69	5.40	5.72
9	5.57	5.75	5.56	5.79	5.71	5.74	5.70	5.71	5.80	5.67	5.79	5.80	5.57	5.89	5.86	5.46	5.67	5.81	5.80	5.77	5.77	5.80	5.80	5.81
10	5.97	5.86	5.85	5.98	5.95	5.99	5.91	5.94	5.82	6.01	5.88	5.74	5.79	5.87	5.62	5.80	5.79	5.71	5.80	5.65	5.84	5.77	5.71	5.70
11	5.51	5.57	5.29	5.53	5.68	5.70	5.66	5.75	5.68	5.72	5.80	M	M	M	M	M	M	M	M	M	M	M	M	M
12	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
13	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
14	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
15	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
16	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
17	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
18	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
19	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
20	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
21	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
22	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
23	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
24	M	M	M	M	M	M	M	M	M	M	M	5.79	5.89	6.11	6.22	6.30	6.44	6.49	6.56	6.53	6.68	6.56	6.56	6.79
25	6.69	6.73	6.69	6.65	6.66	6.71	6.71	6.68	6.72	M	6.73	6.71	6.68	6.79	6.82	6.82	6.77	6.75	6.78	6.79	6.83	6.81	6.81	6.87
26	6.76	6.83	6.70	6.72	M	6.69	6.75	6.72	6.74	6.73	6.69	6.77	6.71	6.82	M	M	M	6.73	6.71	6.64	6.55	6.55	6.47	6.51
27	6.76	6.68	6.55	6.40	6.23	6.31	6.51	6.51	6.53	6.61	6.68	6.69	6.53	6.71	6.64	6.79	6.68	6.70	6.66	6.68	6.74	6.70	6.70	6.73
28	6.65	6.64	6.55	6.40	6.44	6.42	6.52	M	6.61	M	6.61	6.60	6.71	6.62	6.61	6.60	6.62	6.49	6.49	6.55	6.27	M	4.65	5.25

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.
Earlier data available from WDC-A for Solar-Terrestrial Physics cover the period July 1975 - August 1976.

COLUMBIA OSO-8 GRAPHITE CRYSTAL SPECTROMETER DATA
X-RAY EMISSION LINE FLUXES
MARCH 1977

Si XV (5.09Å) Hourly Averages (-Log (flux), ergs/cm² s)

DAY/HR	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	5.10	5.48	5.70	5.91	6.23	6.24	6.40	6.57	6.57	M	M	6.68	6.57	6.39	6.57	6.47	6.59	6.58	6.69	6.69	6.90	6.90	6.63	6.34
2	6.39	6.64	6.82	6.88	5.00	5.44	6.70	6.33	6.38	6.62	M	6.10	6.20	6.33	6.54	6.50	M	M	6.50	6.33	6.25	6.25	7.09	6.77
3	M	6.63	6.44	6.55	6.55	6.52	5.19	6.17	6.29	6.65	6.69	6.65	6.71	6.41	6.59	6.73	6.77	6.81	6.84	6.88	6.74	6.49	6.35	M
4	6.47	6.82	6.76	6.77	6.66	6.66	6.29	6.65	6.72	6.74	6.63	6.71	6.70	6.68	6.60	6.68	6.59	5.98	6.22	6.35	6.69	6.58	6.58	6.60
5	M	6.00	6.16	6.20	6.27	6.59	6.62	6.47	6.13	6.47	6.46	6.29	6.54	6.59	6.50	6.45	6.25	6.46	6.58	5.65	5.97	6.33	6.45	*-1.
6	6.71	6.50	6.64	6.63	6.61	6.75	6.75	6.73	6.48	6.63	6.65	M	6.62	6.87	6.80	6.55	M	6.59	6.55	6.82	6.71	6.69	M	*-1.
7	M	M	6.55	M	6.64	6.55	6.41	6.60	6.71	6.56	6.44	M	M	M	M	M	M	M	M	M	M	M	M	M
8	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
10	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
11	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
12	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
13	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
14	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
15	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
16	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
17	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
18	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
19	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
20	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
21	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
22	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
23	M	M	M	M	M	M	M	M	M	M	M	M	5.30	5.51	5.72	5.71	5.88	5.96	6.01	6.13	6.19	5.71	5.98	6.06
24	6.30	6.36	6.44	6.13	6.18	5.33	5.47	5.99	6.64	6.55	6.53	6.62	M	6.54	6.51	M	6.84	6.70	6.84	6.71	7.00	6.72	6.64	6.71
25	6.64	6.56	6.73	M	6.69	6.80	6.73	6.83	6.67	6.29	6.47	6.64	6.88	6.76	6.63	M	6.63	6.50	6.58	6.73	6.72	6.91	6.71	6.24
26	6.35	6.71	6.77	6.77	6.72	6.79	6.69	6.45	6.73	6.48	6.56	6.64	6.77	6.60	6.76	6.83	6.75	6.95	M	6.66	6.59	6.66	6.75	6.60
27	6.73	6.58	6.29	6.44	6.65	6.74	6.58	6.23	6.61	6.83	6.75	6.69	6.77	6.71	6.86	6.98	6.94	6.97	M	6.82	6.85	6.67	6.60	5.97
28	5.95	6.79	6.49	6.84	6.93	6.94	7.03	6.84	7.00	6.76	7.00	M	6.78	M	7.22	7.21	7.06	6.79	M	6.85	6.85	6.68	7.06	M
29	M	M	M	M	M	6.78	7.17	M	6.86	7.24	M	M	6.85	M	M	M	M	6.54	M	M	M	M	M	M
30	M	M	M	M	6.95	7.16	6.95	M	7.12	M	M	M	M	M	M	6.83	M	M	M	M	M	M	6.92	6.84
31	7.21	7.84	M	7.85	7.18	M	6.90	6.97	7.06	7.02	M	M	M	M	7.09	7.07	M	7.02	6.95	7.15	6.83	6.85	6.92	6.86

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.
Earlier data available from WDC-A for Solar-Terrestrial Physics cover the period July 1975 - August 1976.

COLUMBIA OSO-8 GRAPHITE CRYSTAL SPECTROMETER DATA
X-RAY EMISSION LINE FLUXES

MARCH 1977

Si XIII (5.68A) Hourly Averages (-Log (flux), ergs/cm^{2}s)

DAY/HR	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	5.48	5.86	6.10	6.25	6.56	6.84	6.64	6.90	6.90	M	M	6.98	6.79	6.84	7.08	6.73	6.90	6.83	6.75	7.05	7.19	7.02	7.02	6.53
2	6.46	7.16	M	6.77	5.35	5.77	6.90	6.55	7.04	7.01	M	6.41	6.46	6.66	6.87	7.11	M	M	6.47	6.48	6.77	6.73	7.32	7.20
3	M	7.45	6.81	7.04	6.92	6.88	5.53	6.70	6.68	6.92	B	6.97	7.04	6.95	7.30	B	7.19	7.28	7.35	7.17	7.18	7.68	6.60	M
4	6.85	7.29	7.22	7.18	7.83	7.27	6.53	7.32	7.74	7.66	7.00	7.39	7.19	B	7.08	7.13	7.14	6.39	6.58	6.89	6.95	7.52	7.13	6.99
5	M	6.37	6.47	6.62	6.60	7.34	7.20	6.95	6.74	7.18	7.63	6.78	7.04	7.23	7.13	6.75	6.66	B	6.62	6.11	6.31	6.73	6.71	*-1.
6	7.32	7.24	6.25	7.24	6.89	7.63	6.81	6.92	M	6.83	7.10	M	6.90	6.91	6.41	7.58	M	6.60	6.74	6.60	6.71	6.56	M	*-1.
7	M	M	B	M	7.07	6.58	6.48	7.39	6.97	6.66	M	M	M	M	M	M	M	M	M	M	M	M	M	M
8	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
10	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
11	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
12	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
13	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
14	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
15	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
16	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
17	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
18	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
19	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
20	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
21	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
22	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
23	M	M	M	M	M	M	M	M	M	M	M	M	5.73	5.96	6.10	6.01	6.34	6.44	6.45	6.73	6.42	6.10	6.60	6.54
24	7.71	6.99	7.22	6.76	6.65	5.58	5.79	6.41	7.21	7.16	6.94	6.97	M	6.82	7.04	M	7.39	B	7.63	7.11	B	7.39	7.01	7.14
25	7.85	6.80	7.17	M	7.83	7.29	6.56	7.71	7.46	6.79	6.77	7.03	7.33	B	7.00	M	6.94	7.00	B	7.03	7.10	7.03	6.86	6.92
26	6.80	7.37	6.91	7.25	7.27	B	7.15	7.53	7.03	6.99	6.93	7.21	7.18	6.98	7.38	B	7.07	7.32	M	6.92	6.82	7.16	7.24	7.50
27	7.04	7.14	6.74	6.95	7.10	7.14	7.09	6.56	7.02	7.15	7.32	7.15	6.99	7.03	7.29	7.30	7.32	7.53	M	7.68	7.36	6.97	7.27	6.33
28	6.29	6.96	7.09	7.20	7.25	7.53	7.64	7.25	7.42	7.36	7.34	M	M	M	M	M	7.11	6.94	M	B	7.19	M	M	M
29	M	M	M	M	M	7.47	7.30	M	6.99	7.32	M	M	7.01	M	M	M	M	7.38	M	M	M	M	M	M
30	M	M	M	M	7.33	7.17	7.25	M	7.87	M	M	M	M	M	M	7.02	M	M	M	M	M	M	6.74	7.25
31	7.12	7.52	M	B	7.35	M	7.36	7.30	M	B	M	M	M	M	7.29	7.73	M	7.30	7.16	7.63	7.18	7.04	7.69	7.04

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.
Earlier data available from WDC-A for Solar-Terrestrial Physics cover the period July 1975 - August 1976.

COLUMBIA OSO-8 GRAPHITE CRYSTAL SPECTROMETER DATA
X-RAY EMISSION LINE FLUXES
MARCH 1977

Si XII (5.82Å) Hourly Averages (-Log (flux), ergs/cm^2 s)

DAY/HR	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	5.43	5.71	5.92	5.97	6.17	6.21	6.30	6.44	6.43	M	M	6.40	6.33	6.32	6.35	6.35	6.44	6.38	6.49	6.53	6.50	6.60	6.45	6.41
2	6.35	6.38	6.55	6.21	5.40	5.69	6.53	6.31	6.42	6.41	M	6.21	6.30	6.26	6.37	6.46	M	M	6.40	6.37	6.27	6.39	6.38	6.45
3	M	6.48	6.42	6.42	6.49	6.45	5.61	6.20	6.32	6.42	6.46	6.46	6.46	6.39	6.43	6.46	6.52	6.56	6.53	6.55	6.49	6.53	6.36	M
4	6.41	6.47	6.52	6.47	6.42	6.43	6.29	6.43	6.45	6.50	6.42	6.49	6.39	6.40	6.40	6.41	6.35	6.19	6.24	6.30	6.43	6.43	6.42	6.36
5	M	6.06	6.18	6.21	6.19	6.42	6.35	6.23	6.21	6.24	6.16	5.91	6.18	6.25	6.19	6.19	6.17	6.17	6.16	5.75	5.98	6.13	6.21	*-1.
6	6.25	6.17	6.29	6.22	6.24	6.14	6.23	6.25	6.13	6.19	6.17	M	6.25	6.14	6.01	6.00	M	6.25	5.90	5.99	6.16	6.06	M	*-1.
7	M	M	6.09	M	6.23	6.42	6.22	6.16	6.26	6.05	5.91	M	M	M	M	M	M	M	M	M	M	M	M	M
8	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
9	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
10	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
11	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
12	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
13	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
14	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
15	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
16	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
17	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
18	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
19	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
20	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
21	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
22	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
23	M	M	M	M	M	M	M	M	M	M	M	M	5.57	5.78	5.97	5.99	6.04	6.08	6.14	6.18	6.21	5.97	6.08	6.16
24	6.18	6.23	6.31	6.19	6.15	5.79	5.56	5.90	6.28	6.25	6.25	6.21	M	6.32	6.34	M	6.45	6.37	6.41	6.42	6.49	6.36	6.39	6.38
25	6.38	6.34	6.35	M	6.42	6.48	6.42	6.39	6.37	6.32	6.32	6.34	6.44	6.51	6.37	M	6.36	6.30	6.36	6.48	6.41	6.55	6.43	6.40
26	6.29	6.36	6.41	6.43	6.43	6.45	6.45	6.37	6.41	6.28	6.32	6.32	6.39	6.35	6.46	6.42	6.45	6.58	M	6.48	6.40	6.41	6.46	6.40
27	6.45	6.35	6.27	6.33	6.43	6.45	6.38	6.25	6.36	6.53	6.46	6.45	6.55	6.43	6.51	6.55	6.58	6.59	M	6.51	6.45	6.42	6.36	6.22
28	6.11	6.47	6.46	6.53	6.48	6.48	6.58	6.57	6.57	6.52	6.49	M	6.41	M	6.53	6.47	6.62	6.67	M	6.48	6.41	6.72	6.60	M
29	M	M	M	M	M	6.47	6.52	M	6.60	6.54	M	M	6.48	M	M	M	M	6.53	M	M	M	M	M	M
30	M	M	M	M	6.67	6.90	6.65	M	6.60	M	M	M	M	M	M	6.69	M	M	M	M	M	M	6.65	6.55
31	6.61	6.63	M	6.74	6.63	M	6.63	6.76	6.51	6.61	M	M	M	M	6.60	6.69	M	6.69	6.64	6.64	6.53	6.49	6.55	6.55

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.
Earlier data available from WDC-A for Solar-Terrestrial Physics cover the period July 1975 - August 1976.

COLUMBIA OSO-8 GRAPHITE CRYSTAL SPECTROMETER DATA
X-RAY EMISSION LINE FLUXES

APRIL 1977

Si XV (5.09Å) Hourly Averages (-Log (flux), ergs/cm² s)

DAY/HR	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	M	7.06	6.79	6.76	6.76	6.89	6.92	6.76	M	6.97	M	M	M	M	M	6.69	M	6.62	6.78	M	6.89	6.77	6.77	6.91
2	M	6.70	6.62	6.29	6.72	6.64	6.54	5.55	M	M	M	6.35	M	M	M	6.00	6.49	6.58	6.48	M	6.45	6.43	6.46	6.48
3	6.38	6.50	6.51	M	6.61	6.70	6.64	6.37	M	5.90	6.23	M	M	M	M	M	6.61	M	6.81	M	6.82	6.18	5.78	4.84
4	5.71	5.54	4.86	M	5.41	5.71	5.73	5.90	M	6.08	6.18	M	6.32	M	M	6.53	6.68	M	6.61	6.80	6.90	6.83	M	6.84
5	6.40	6.27	6.83	6.68	6.78	6.84	M	7.03	M	6.69	6.12	M	6.30	M	M	6.89	7.00	M	7.01	6.87	6.76	6.75	M	6.98
6	6.89	6.89	7.05	6.99	6.95	6.68	M	6.37	6.78	6.90	7.21	M	6.44	M	M	M	6.96	M	7.03	7.34	M	6.61	M	6.80
7	6.02	M	M	5.63	5.77	5.26	M	6.06	M	M	6.42	M	M	M	M	M	M	M	6.43	6.67	M	6.36	M	M
8	6.71	M	6.58	M	M	6.78	M	M	7.00	M	M	M	M	7.00	M	M	M	M	M	M	M	6.57	6.33	6.43
9	6.63	M	M	M	M	6.32	M	6.55	6.88	M	6.22	6.10	6.12	6.01	6.11	6.08	6.04	6.25	6.19	6.17	6.00	5.76	M	5.08
10	5.24	5.26	5.40	5.74	M	4.89	5.22	5.39	5.90	M	5.86	5.55	M	5.44	5.33	5.55	5.57	5.76	5.58	5.66	5.86	5.45	5.71	5.73
11	5.74	5.52	5.76	5.29	5.69	5.59	5.78	5.89	5.53	5.70	5.55	5.71	5.31	5.27	5.31	4.61	4.76	5.06	5.21	5.42	5.45	5.41	4.31	4.86
12	5.18	5.76	5.91	5.44	5.86	5.45	5.73	5.77	5.59	5.65	5.34	4.13	4.32	4.40	4.70	4.88	4.94	5.09	5.18	5.34	5.33	5.41	5.51	5.40
13	5.47	5.50	5.62	5.56	5.16	5.51	4.98	M	5.36	5.49	5.22	5.26	4.71	4.59	4.82	5.28	4.83	5.03	4.32	4.61	4.94	5.10	4.38	4.55
14	4.59	4.86	4.64	4.85	5.02	5.14	M	4.65	4.74	5.13	M	5.29	5.47	M	5.54	5.48	5.54	5.53	5.52	5.01	5.47	5.04	M	M
15	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
16	5.50	5.33	5.29	5.66	5.49	5.81	5.76	4.60	4.08	4.69	5.36	5.49	5.03	5.54	5.43	5.73	5.81	5.81	5.36	5.66	5.42	3.87	4.57	4.90
17	3.75	3.87	4.18	4.09	4.44	4.55	4.64	5.33	5.37	5.57	5.72	5.43	5.22	5.81	5.99	6.02	5.95	6.04	6.06	6.13	6.02	5.55	5.90	5.73
18	6.15	6.26	6.25	6.07	6.02	6.15	6.22	6.20	6.03	6.08	6.32	6.29	6.17	6.33	6.33	6.30	6.34	6.32	5.32	6.19	6.43	6.24	6.14	5.98
19	6.06	6.14	6.23	6.28	6.31	6.01	6.17	6.13	4.93	4.79	6.10	6.38	6.12	M	6.26	4.10	M	5.05	5.80	M	5.20	M	6.18	5.77
20	M	4.90	5.46	M	6.10	5.97	5.85	5.79	M	5.47	5.46	M	5.88	5.88	5.84	5.85	M	4.44	5.22	M	5.77	5.77	M	6.25
21	M	6.25	6.24	M	6.22	5.93	6.00	5.85	M	4.68	6.01	5.51	5.77	6.45	6.07	6.03	6.21	5.92	6.24	6.13	6.21	6.05	6.05	6.24
22	6.33	6.06	6.03	M	5.77	5.97	5.03	5.10	5.40	5.39	5.67	6.00	5.71	5.05	4.81	5.41	5.49	6.02	6.43	6.13	6.11	6.21	6.01	5.90
23	6.03	6.05	5.65	6.02	5.47	6.16	6.30	6.33	6.17	6.23	6.26	6.17	5.98	6.23	6.11	5.98	6.18	6.09	6.13	5.78	6.07	6.09	M	6.36
24	6.33	6.21	6.25	5.79	5.73	5.93	6.12	6.18	6.04	6.09	6.06	6.30	6.35	6.17	6.14	6.16	6.25	6.36	6.37	6.23	6.35	6.33	6.30	6.08
25	6.10	6.35	6.36	6.23	6.31	6.11	6.26	6.18	6.21	6.23	6.32	5.85	6.21	6.08	6.12	6.20	6.20	6.23	6.39	6.37	6.32	6.31	6.27	5.95
26	6.19	6.22	6.18	6.13	6.07	6.01	6.21	6.25	6.26	6.50	6.36	6.47	6.54	6.51	6.49	6.59	6.57	6.47	6.52	6.52	6.45	6.46	6.35	6.49
27	6.65	6.70	6.84	6.65	6.66	6.69	6.73	6.74	6.71	6.84	6.76	6.84	6.92	6.84	6.52	6.76	6.74	6.75	6.86	6.83	6.79	7.05	6.96	*-1.
28	6.85	6.48	6.54	6.49	6.51	6.80	6.86	6.87	6.98	6.58	6.92	6.72	6.53	6.50	6.86	6.72	6.59	5.89	5.93	6.07	6.51	6.33	5.98	5.78
29	6.90	5.92	5.98	5.98	6.05	6.19	6.28	6.44	6.53	6.64	6.79	6.71	6.74	6.62	6.57	6.70	6.66	6.59	6.60	6.63	6.70	6.70	6.60	6.61
30	6.52	6.07	5.98	6.03	5.99	5.36	5.61	5.89	5.84	5.95	5.94	5.71	5.76	5.51	5.33	5.75	5.96	6.15	5.80	6.00	5.97	6.03	5.99	5.99

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.
Earlier data available from WDC-A for Solar-Terrestrial Physics cover the period July 1975 - August 1976.

COLUMBIA OSO-8 GRAPHITE CRYSTAL SPECTROMETER DATA
X-RAY EMISSION LINE FLUXES

APRIL 1977

Si XIII (5.68A) Hourly Averages (-Log (flux), ergs/cm^{2}s)

DAY/HR	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	M	7.42	B	7.12	7.27	7.13	7.57	7.00	M	B	M	M	M	M	M	7.14	M	7.07	7.46	M	7.31	7.20	B	7.60
2	M	7.16	6.95	6.68	7.49	6.77	7.10	5.85	M	M	M	6.79	M	M	M	6.40	6.78	7.29	6.79	M	7.03	6.77	7.03	6.95
3	6.72	6.91	6.86	M	7.08	7.20	7.07	6.68	M	6.38	6.77	M	M	M	M	M	7.23	M	7.56	M	7.69	6.58	6.11	5.24
4	6.14	5.95	5.25	M	5.82	6.09	6.14	6.30	M	6.76	6.78	M	6.89	M	M	6.80	B	M	6.95	7.42	6.89	7.21	M	7.29
5	B	6.61	7.25	M	7.33	7.36	M	7.08	M	7.75	6.55	M	M	M	M	7.55	7.11	M	7.15	7.27	7.04	7.10	M	M
6	7.35	7.53	7.08	7.05	7.33	7.53	M	6.94	7.05	M	7.21	M	7.10	M	M	M	7.37	M	7.32	7.59	M	7.52	M	6.96
7	6.48	M	M	6.15	6.10	5.74	M	6.57	M	M	7.18	M	M	M	M	M	M	M	6.78	M	M	6.96	M	M
8	6.75	M	6.88	M	M	7.08	M	M	6.95	M	M	M	M	7.22	M	M	M	M	M	M	M	M	5.83	6.16
9	6.25	M	M	M	M	6.52	M	7.10	6.66	M	6.55	6.53	6.42	6.27	6.36	6.57	6.60	6.90	6.50	6.50	6.25	6.09	M	5.40
10	5.59	5.59	5.89	6.13	M	5.28	5.65	5.73	6.33	M	6.28	6.03	M	5.91	5.71	5.96	5.97	6.22	6.06	6.09	6.30	5.88	6.10	6.22
11	6.02	5.91	6.19	5.67	6.05	6.01	6.27	6.46	5.95	6.13	6.02	6.04	5.68	5.74	5.69	4.97	5.16	5.44	5.64	5.82	5.89	5.84	4.76	5.30
12	5.66	6.35	6.36	5.80	6.21	5.85	6.20	6.29	5.90	5.97	5.67	4.50	4.75	4.80	5.08	5.24	5.29	5.42	5.50	5.70	5.65	5.75	5.78	5.75
13	5.76	5.84	5.98	5.88	5.65	5.85	5.34	M	5.65	5.78	5.53	5.55	5.86	4.94	5.13	5.65	5.17	5.39	4.67	4.95	5.32	5.44	4.77	4.94
14	4.98	5.22	5.03	5.25	5.46	5.56	M	4.94	5.07	5.46	M	5.57	5.76	M	5.89	5.86	5.88	5.89	5.83	5.37	5.80	5.34	M	M
15	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
16	5.98	5.64	5.64	6.12	5.84	6.19	6.11	4.87	4.44	5.80	5.64	5.80	5.33	5.82	5.71	6.16	6.13	6.14	5.73	5.97	5.76	4.20	4.91	5.24
17	4.16	4.25	4.52	4.43	4.82	4.93	5.03	5.76	5.75	5.97	6.07	5.73	5.69	6.39	6.46	6.36	6.28	6.29	6.34	6.45	6.43	5.88	6.47	6.19
18	6.72	6.54	6.55	6.45	6.34	6.53	B	6.48	6.24	6.55	6.82	6.64	6.52	6.77	6.77	6.62	6.70	6.58	5.66	6.62	6.82	6.74	6.52	6.36
19	6.51	6.53	6.61	6.65	6.71	6.45	6.47	6.71	5.21	5.14	6.56	6.67	6.42	M	6.61	4.46	M	5.42	6.24	M	5:59	M	6.42	6.20
20	M	5.31	5.85	M	6.37	6.32	6.20	6.11	M	5.82	5.79	M	6.22	6.30	6.27	6.34	M	4.80	5.64	M	6.12	6.17	M	6.58
21	M	6.65	6.62	M	6.67	6.34	6.59	6.32	M	5.05	6.39	5.88	6.21	7.59	6.56	6.44	6.88	6.50	6.83	6.65	6.71	6.64	6.63	7.01
22	7.59	6.46	6.41	M	6.25	6.44	5.46	5.54	5.92	5.88	6.14	6.48	6.13	5.44	5.22	5.84	5.88	6.47	7.02	6.49	6.50	6.70	6.39	6.25
23	6.44	6.46	6.08	6.47	5.78	6.59	6.69	6.86	6.61	6.61	6.67	6.56	6.27	6.60	6.39	6.28	6.56	6.48	6.46	6.11	6.45	6.97	M	AP
24	6.79	6.60	6.63	6.14	6.11	6.38	6.63	6.51	6.39	6.45	6.43	6.63	6.82	6.55	6.59	6.60	6.59	6.55	6.99	6.60	6.68	7.04	6.64	6.39
25	6.39	6.71	6.82	6.98	6.75	6.43	6.66	6.46	6.56	6.56	6.89	6.22	6.57	6.38	6.54	6.97	6.65	6.77	6.76	6.83	6.69	6.67	6.58	6.27
26	6.54	6.60	6.56	6.42	6.53	6.38	6.57	6.57	6.56	7.12	6.76	7.16	6.90	6.90	6.90	7.07	7.54	7.05	6.90	7.66	6.95	6.97	6.79	7.04
27	7.04	7.08	7.70	7.22	7.11	7.09	B	7.24	7.11	7.22	6.98	B	7.38	7.15	7.62	7.05	7.17	B	7.33	7.42	7.27	B	7.33	*-1.
28	M	7.29	7.04	6.66	6.89	7.10	7.26	7.29	7.46	6.89	7.49	7.17	6.97	6.96	7.24	7.02	7.04	6.23	6.40	6.59	6.94	6.68	6.37	6.27
29	7.15	6.38	6.42	6.54	6.58	6.71	6.87	6.82	6.98	7.18	7.47	7.36	7.04	7.08	6.88	7.01	7.06	7.28	6.95	7.05	7.05	7.17	6.88	6.97
30	6.79	6.39	6.29	6.29	6.36	5.62	5.90	6.19	6.20	6.31	6.26	6.01	6.08	5.82	5.56	6.06	6.26	6.46	6.11	6.26	6.31	6.38	6.32	6.31

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.
Earlier data available from WDC-A for Solar-Terrestrial Physics cover the period July 1975 - August 1976.

COLUMBIA OSO-8 GRAPHITE CRYSTAL SPECTROMETER DATA
X-RAY EMISSION LINE FLUXES

APRIL 1977

Si XII (5.82Å) Hourly Averages (-Log (flux), ergs/cm^2 s)

DAY/HR	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	M	6.66	6.54	6.51	6.49	6.47	6.55	6.49	M	6.66	M	M	M	M	M	6.39	M	6.37	6.51	M	6.55	6.54	6.52	6.54
2	M	6.46	6.42	6.33	6.45	6.35	6.35	5.88	M	M	M	6.33	M	M	M	6.02	6.35	6.25	6.33	M	6.38	6.30	6.33	6.32
3	6.29	6.29	6.29	M	6.37	6.38	6.38	6.25	M	5.96	6.07	M	M	M	M	M	6.38	M	6.44	M	6.45	6.26	6.04	5.46
4	6.06	5.90	5.36	M	5.66	5.88	5.94	6.00	M	6.06	6.09	M	6.12	M	M	6.35	6.41	M	6.37	6.47	6.48	6.46	M	6.52
5	6.35	6.28	6.57	6.50	6.54	6.52	M	5.97	M	6.55	6.26	M	6.36	M	M	6.56	6.68	M	6.55	6.66	6.74	6.63	M	6.64
6	6.65	6.55	6.79	6.71	6.72	6.32	M	6.29	6.53	6.52	6.76	M	6.70	M	M	M	6.71	M	6.61	6.54	M	6.47	M	6.64
7	6.46	M	M	6.67	6.06	5.86	M	6.34	M	M	6.44	M	M	M	M	M	M	M	6.74	6.54	M	6.47	M	M
8	6.52	M	6.52	M	M	6.77	M	M	6.40	M	M	M	M	6.88	M	M	M	M	M	M	M	5.55	5.29	5.23
9	5.31	M	M	M	M	6.31	M	6.37	6.50	M	6.40	6.17	6.23	6.17	6.09	6.17	6.21	6.33	6.16	6.26	6.15	6.07	M	5.47
10	6.15	5.63	5.65	5.88	M	5.30	5.52	5.63	5.94	M	5.97	5.82	M	5.66	5.64	5.71	5.82	5.94	5.90	5.82	6.00	5.74	5.82	5.82
11	5.91	5.77	5.84	5.54	5.73	5.71	5.82	5.84	5.72	5.75	5.73	5.81	5.60	5.61	5.67	5.13	5.24	5.40	5.43	5.57	5.60	5.58	4.82	5.20
12	5.35	5.74	5.82	5.70	5.91	5.75	5.81	5.85	5.74	5.71	5.62	4.62	4.89	4.95	5.12	5.24	5.28	5.36	5.40	5.50	5.52	5.55	5.62	5.60
13	5.58	5.59	5.68	5.65	5.54	5.59	5.38	M	5.54	5.62	5.49	5.50	5.07	4.97	5.13	5.54	5.30	5.37	4.75	4.96	5.22	5.31	4.85	4.91
14	4.95	5.21	5.09	5.19	5.36	5.37	M	5.00	5.06	5.29	M	5.47	5.54	M	5.61	5.60	5.63	5.62	5.67	5.38	5.63	5.41	M	M
15	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
16	5.65	5.53	5.63	5.76	5.62	5.80	5.79	5.27	4.75	5.09	5.49	5.58	5.36	5.61	5.57	5.73	5.81	5.79	5.54	5.68	5.63	4.42	5.06	5.39
17	4.31	4.39	4.65	4.59	4.76	4.91	4.95	5.38	5.45	5.58	5.68	5.63	5.31	5.74	5.87	5.91	5.92	5.97	5.95	6.02	5.99	5.82	5.88	5.80
18	6.04	6.06	6.12	6.14	6.00	6.06	6.00	6.11	6.03	6.07	6.11	6.08	6.07	6.18	6.21	6.17	6.16	6.20	5.64	6.09	6.19	6.18	6.18	6.09
19	6.11	6.14	6.16	6.12	6.16	6.11	6.10	6.09	5.39	5.28	6.00	6.12	6.16	M	6.26	4.77	M	5.39	5.84	M	5.59	M	6.05	6.02
20	M	5.43	5.62	M	5.99	6.13	6.01	5.90	M	5.67	5.75	M	5.96	5.95	5.97	5.97	M	5.13	5.45	M	5.88	5.87	M	6.13
21	M	6.14	6.17	M	6.12	6.04	5.99	6.03	M	5.27	5.99	5.87	5.96	6.30	6.15	6.10	6.13	6.05	6.12	6.10	6.11	6.15	6.10	6.18
22	6.22	6.11	6.09	M	5.92	6.00	5.58	5.55	5.68	5.67	5.84	6.05	5.90	5.58	5.32	5.64	5.77	5.96	6.30	6.24	6.18	6.20	6.08	6.03
23	6.02	6.13	5.98	6.07	5.93	6.09	6.14	6.17	6.06	6.02	6.15	6.10	6.05	6.10	6.06	5.99	6.09	6.03	6.07	5.89	5.95	6.01	M	6.24
24	6.10	6.11	6.12	5.92	5.90	5.94	6.06	6.08	5.96	6.00	6.02	6.15	6.20	6.17	6.13	6.19	6.14	5.99	6.17	6.06	6.19	6.20	6.14	6.12
25	6.06	6.19	6.17	6.15	6.16	6.07	6.17	6.07	6.14	6.12	6.16	6.01	6.06	6.04	6.09	6.09	6.13	6.16	6.27	6.20	6.21	6.18	6.18	6.12
26	6.11	6.08	6.06	6.06	6.07	6.11	6.12	6.16	6.15	6.24	6.24	6.27	6.30	6.32	6.31	6.37	6.32	6.28	6.36	6.32	6.32	6.28	6.25	6.30
27	6.36	6.41	6.41	6.41	6.41	6.39	6.49	6.42	6.45	6.48	6.44	6.56	6.55	6.51	6.39	6.48	6.48	6.51	6.57	6.54	6.56	6.52	6.62	*-1.
28	6.52	6.42	6.53	6.47	6.43	6.56	6.61	6.62	6.70	6.54	6.72	6.57	6.49	6.47	6.62	6.59	6.55	6.19	6.12	6.18	6.40	6.39	6.21	6.00
29	6.52	6.08	6.11	6.14	6.16	6.24	6.27	6.36	6.42	6.45	6.56	6.52	6.58	6.53	6.45	6.46	6.42	6.43	6.43	6.37	6.40	6.44	6.42	6.35
30	6.33	6.12	6.06	6.03	6.08	5.66	5.77	5.91	5.95	5.97	6.00	5.85	5.84	5.67	5.55	5.75	5.92	6.00	5.85	5.94	5.95	6.00	5.98	6.02

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.
Earlier data available from WDC-A for Solar-Terrestrial Physics cover the period July 1975 - August 1976.

COLUMBIA OSO-8 GRAPHITE CRYSTAL SPECTROMETER DATA
X-RAY EMISSION LINE FLUXES

MAY 1977

Si XV (5.09Å) Hourly Averages (-Log (flux), ergs/cm² s)

DAY/HR	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	5.81	6.07	5.84	6.09	5.98	M	M	6.01	6.07	6.07	6.11	6.37	6.19	6.20	6.26	6.24	6.19	6.20	6.19	6.31	6.19	6.20	6.17	6.23
2	6.19	6.34	6.28	6.33	6.40	6.16	6.20	6.33	6.32	6.40	6.40	6.37	6.34	6.30	6.30	6.23	6.05	6.04	6.14	6.12	6.05	6.15	6.02	6.03
3	5.99	5.94	5.62	5.71	5.44	5.39	5.12	5.36	5.40	5.39	5.50	5.64	5.70	5.59	5.59	5.02	5.13	5.19	5.42	5.77	5.48	M	5.51	4.48
4	5.33	5.44	5.50	5.82	5.65	5.47	5.77	5.83	5.80	5.72	5.86	5.22	5.57	5.29	5.16	5.56	5.59	4.83	4.88	5.65	5.59	5.64	5.81	5.67
5	5.78	5.85	5.84	5.93	5.78	5.55	5.77	5.99	5.98	6.00	5.94	6.16	6.13	6.17	6.22	6.07	6.04	6.21	6.00	6.11	6.08	5.87	5.66	5.96
6	6.21	6.15	6.15	6.19	6.19	6.12	5.63	4.90	6.08	6.18	6.06	6.24	6.25	6.25	6.21	6.28	6.24	6.08	6.15	6.35	6.46	6.12	6.27	6.19
7	6.27	6.23	5.81	6.17	6.04	5.93	6.02	6.22	6.36	6.31	6.30	6.32	6.34	6.35	6.36	M	6.26	6.12	6.23	6.31	6.33	6.31	6.18	6.15
8	5.79	5.96	6.16	5.92	6.10	6.03	6.03	6.12	6.20	6.10	5.87	5.89	5.94	5.98	5.89	5.94	5.75	5.57	5.89	6.06	M	M	M	6.01
9	5.94	5.61	5.44	5.47	5.76	5.91	5.97	5.92	5.95	5.06	4.99	5.25	M	M	M	M	M	M	M	M	M	M	M	5.75
10	5.79	5.84	5.87	5.88	5.88	5.86	5.80	5.78	5.79	5.85	5.92	5.89	6.07	5.97	5.82	6.04	6.11	5.99	6.04	5.99	5.97	5.99	6.09	M
11	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	6.13
12	6.12	6.12	5.91	5.67	6.02	5.94	6.08	6.14	6.16	6.07	5.06	5.63	6.05	6.08	6.21	5.95	M	6.17	6.22	6.28	6.17	6.33	6.20	6.19
13	6.14	6.14	6.07	5.98	5.94	6.24	6.17	6.08	6.12	6.03	6.21	6.12	5.95	5.89	5.99	5.92	5.80	5.84	5.89	5.98	5.89	5.98	5.99	6.01
14	5.94	5.99	5.99	5.97	5.86	5.88	5.96	5.91	6.03	5.69	5.82	5.98	5.90	5.63	M	5.84	5.49	5.38	5.84	M	5.91	5.93	5.88	5.93
15	5.87	5.92	5.90	5.86	5.91	5.88	5.84	5.69	5.79	5.89	5.92	5.91	5.69	5.89	M	5.68	5.82	5.89	5.63	5.62	5.83	5.65	5.73	5.42
16	5.57	5.76	5.69	5.79	5.76	5.88	5.95	M	M	M	M	5.41	5.68	5.92	5.94	5.81	5.78	M	5.89	5.87	5.87	6.02	5.95	5.56
17	6.02	6.13	5.86	5.92	6.13	6.08	6.03	6.10	5.87	6.06	5.77	5.66	5.76	6.06	5.98	5.83	6.07	M	5.59	6.07	6.04	6.03	M	5.45
18	6.05	6.07	6.01	5.29	5.85	5.45	5.72	6.15	6.33	6.19	5.97	M	6.23	6.22	6.10	M	M	M	6.24	6.35	6.25	6.09	M	6.22
19	5.19	4.62	5.59	M	6.11	6.25	6.05	5.95	6.19	6.25	5.92	5.89	M	5.89	5.66	M	6.06	6.23	6.20	6.05	5.81	6.34	6.30	*-1.
20	6.19	6.30	6.33	6.18	6.26	6.27	6.27	6.35	6.16	5.96	M	6.32	6.55	6.39	6.37	M	6.36	6.58	M	6.49	6.46	6.46	6.43	*-1.
21	6.47	6.48	6.32	6.37	6.54	6.48	6.44	6.46	6.46	6.48	M	6.42	6.47	6.37	6.49	6.53	6.50	6.46	6.41	6.33	6.39	6.27	6.26	6.34
22	6.21	6.36	6.32	5.87	6.33	6.46	5.88	6.17	6.08	6.15	6.18	6.15	6.13	M	M	6.24	6.34	6.24	M	5.60	5.19	5.39	5.81	5.85
23	5.36	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	6.42
24	6.38	6.20	6.21	6.16	6.37	6.36	6.03	5.81	5.87	6.01	M	6.13	6.29	M	6.41	6.45	6.53	6.53	6.47	6.44	6.61	6.71	6.50	*-1.
25	6.82	6.78	6.91	6.69	6.36	6.59	6.90	M	6.88	6.80	7.02	6.94	6.87	M	6.64	6.71	M	6.85	6.75	6.70	6.95	7.26	7.22	6.94
26	6.95	6.91	7.08	6.97	6.34	6.39	6.63	M	6.75	6.78	6.64	7.04	6.76	6.94	7.26	7.02	M	7.15	7.13	7.33	7.13	7.15	7.01	6.80
27	6.19	6.86	6.21	6.39	6.96	M	6.84	6.56	6.59	6.85	M	6.66	6.95	6.63	6.75	6.99	M	6.97	7.05	M	6.59	5.83	5.93	6.65
28	6.71	6.85	6.90	6.64	6.70	M	6.79	6.91	M	6.80	M	6.78	6.67	6.84	6.79	6.89	7.00	6.91	6.66	M	6.81	6.95	6.65	6.71
29	6.72	6.39	6.59	6.66	6.61	M	6.33	6.51	M	6.58	6.42	6.36	6.39	6.55	M	6.41	6.11	6.09	6.00	M	5.54	5.71	M	5.55
30	5.87	5.82	5.71	M	5.56	5.90	5.76	5.71	M	5.71	5.70	M	5.42	5.26	5.12	4.88	4.92	M	4.91	5.03	5.06	5.52	M	5.56
31	5.51	5.46	5.05	M	5.32	5.27	5.23	5.44	M	5.23	5.39	4.85	5.39	5.23	5.52	5.59	5.52	M	5.48	5.84	5.85	5.45	5.47	5.32

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.
Earlier data available from WDC-A for Solar-Terrestrial Physics cover the period July 1975 - August 1976.

COLUMBIA OSO-8 GRAPHITE CRYSTAL SPECTROMETER DATA
X-RAY EMISSION LINE FLUXES

MAY 1977

Si XIII (5.68A) Hourly Averages (-Log (flux), ergs/cm^{2}s)

DAY/HR	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	6.13	6.40	6.26	6.43	6.31	M	M	6.24	6.37	6.40	6.58	6.82	6.47	6.48	6.67	6.67	6.56	6.90	6.48	6.47	6.58	6.53	6.47	6.57
2	6.58	6.61	6.55	6.54	6.86	6.54	6.71	6.77	6.82	6.90	6.86	6.69	6.91	7.00	6.67	6.53	6.37	6.31	6.45	6.46	6.33	6.52	6.28	6.34
3	6.33	6.19	5.93	6.03	5.75	5.75	5.49	5.72	5.73	5.75	5.92	6.05	6.08	5.95	5.88	5.42	5.51	5.55	5.74	6.13	5.86	M	5.85	4.83
4	5.74	5.91	5.88	6.19	5.96	5.89	6.10	6.23	6.21	6.10	6.27	5.54	5.97	5.63	5.51	5.85	5.93	5.12	5.17	6.03	5.93	5.94	6.05	5.99
5	6.15	6.22	6.18	6.33	6.07	5.84	6.15	6.34	6.32	6.34	6.24	6.54	6.42	6.58	6.62	6.46	6.37	6.59	6.38	6.48	6.25	6.18	5.94	6.34
6	6.72	6.44	6.59	6.59	6.61	6.49	5.92	5.19	6.44	6.62	6.44	6.58	6.72	6.66	6.80	6.52	6.60	6.39	6.54	6.86	7.03	6.44	7.93	6.57
7	6.68	6.52	6.12	6.61	6.61	6.27	6.57	6.68	6.77	7.03	6.58	6.72	6.71	6.80	6.87	M	6.75	6.56	6.80	6.70	6.70	6.99	6.61	6.58
8	6.28	6.42	6.78	6.47	6.68	6.41	6.49	6.53	6.63	7.02	6.23	6.29	6.49	6.47	6.30	6.53	6.16	5.95	6.39	6.49	M	M	M	6.27
9	6.39	5.99	5.79	5.87	6.14	6.49	6.57	6.30	7.51	5.36	5.40	5.69	M	M	M	M	M	M	M	M	M	M	M	6.25
10	6.35	6.35	6.37	6.38	6.31	6.32	6.40	6.19	6.21	6.30	6.43	6.39	6.51	6.37	6.36	6.52	6.52	6.52	6.55	6.51	6.29	6.45	6.53	M
11	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	6.71
12	6.80	6.65	6.38	6.18	6.49	6.50	6.88	7.62	6.69	6.72	5.53	6.09	6.56	6.78	6.78	6.48	M	6.81	7.12	6.53	6.79	6.74	7.36	B
13	6.76	6.63	6.54	6.58	6.26	6.65	6.58	6.55	6.91	6.51	6.61	6.49	6.45	6.92	6.25	6.61	6.35	6.38	6.38	6.55	6.44	6.58	6.57	6.42
14	6.31	6.45	6.48	6.41	6.26	6.24	6.50	6.31	6.50	6.01	6.30	6.45	6.36	6.09	M	6.30	5.79	5.76	6.39	M	6.46	6.44	6.33	6.53
15	6.13	6.30	6.38	6.37	6.67	6.33	6.36	6.15	6.22	6.42	6.45	6.72	6.06	6.44	M	6.14	6.26	6.25	6.09	6.04	6.31	6.11	6.36	5.79
16	6.00	6.31	6.24	6.17	6.24	6.30	6.50	M	M	M	M	5.74	6.05	6.42	6.56	6.11	6.28	M	6.32	6.22	6.27	6.41	6.91	5.82
17	6.45	6.53	6.25	6.37	6.60	6.55	6.53	6.59	6.22	6.43	6.74	5.99	6.07	6.45	6.54	6.20	6.51	M	5.94	6.40	6.43	6.79	M	5.77
18	6.73	6.57	6.51	5.74	6.30	5.86	6.07	6.87	6.74	6.66	6.45	M	6.70	6.61	6.37	M	M	M	6.59	6.73	6.78	6.55	M	6.84
19	5.52	5.83	6.10	M	6.61	6.74	6.34	6.43	6.67	6.76	6.34	6.39	M	6.29	6.10	M	6.61	7.00	6.67	6.59	6.23	6.89	7.56	*-1.
20	6.70	6.77	7.51	6.61	6.66	6.80	6.60	6.82	6.65	6.39	M	6.96	7.01	7.01	7.18	M	6.85	7.25	M	7.18	6.70	6.78	6.71	*-1.
21	6.79	7.02	6.79	6.69	6.98	6.84	6.92	6.65	6.93	6.73	M	6.52	6.88	7.22	6.97	7.18	7.35	6.90	6.99	6.94	6.98	6.73	6.68	*-1.
22	7.00	6.91	6.63	6.39	6.94	6.84	6.80	6.84	6.38	7.14	6.56	6.88	6.35	M	M	6.55	6.63	7.02	M	6.16	5.52	5.76	6.33	6.26
23	5.85	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	6.80
24	6.95	6.52	6.71	6.61	7.18	6.76	6.39	6.24	6.31	6.41	M	6.43	6.72	M	7.45	7.35	6.90	6.94	7.17	7.22	7.16	7.17	7.77	*-1.
25	7.27	7.41	7.17	7.32	6.97	7.04	7.23	M	6.90	7.04	7.27	7.36	7.37	M	7.64	7.34	M	7.17	6.93	7.52	B	M	B	7.51
26	B	7.74	M	7.31	6.78	6.70	6.92	M	7.06	7.34	7.08	M	7.48	7.37	7.14	7.35	M	7.54	7.70	7.57	7.84	M	B	7.19
27	6.56	B	6.58	6.88	7.38	M	7.21	7.20	7.85	6.92	M	7.42	7.20	6.74	7.16	6.88	M	7.40	7.83	M	7.45	6.15	6.23	7.19
28	7.50	7.88	7.33	7.28	7.09	M	7.10	B	M	B	M	7.16	7.54	7.22	7.92	B	7.00	7.26	B	M	B	7.62	7.11	7.23
29	7.62	7.39	7.39	M	7.64	M	6.94	7.22	M	7.03	6.68	6.60	7.05	6.88	M	6.94	6.76	6.54	6.48	M	6.09	6.27	M	6.01
30	6.39	6.42	6.26	M	6.07	6.73	6.32	6.22	M	6.21	6.19	M	5.82	5.68	5.52	5.36	5.29	M	5.35	5.50	5.49	6.00	M	5.98
31	5.87	5.83	5.36	M	5.66	5.59	5.53	5.80	M	5.57	5.71	5.15	5.82	5.65	6.03	5.93	5.96	M	5.84	6.21	6.23	5.76	5.88	5.69

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.
Earlier data available from WDC-A for Solar-Terrestrial Physics cover the period July 1975 - August 1976.

COLUMBIA OSO-8 GRAPHITE CRYSTAL SPECTROMETER DATA
X-RAY EMISSION LINE FLUXES
MAY 1977

Si XII (5.82Å) Hourly Averages (-Log (flux), ergs/cm^2 s)

DAY/HR	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	5.94	6.03	5.96	6.01	5.95	M	M	6.00	6.03	6.05	6.11	6.18	6.12	6.09	6.13	6.07	6.09	6.08	6.10	6.05	6.08	6.06	6.04	6.10
2	6.10	6.14	6.14	6.18	6.20	6.12	6.15	6.16	6.14	6.18	6.19	6.14	6.15	6.14	6.11	6.09	6.06	5.99	6.11	6.03	6.01	6.04	5.95	5.97
3	5.93	5.92	5.79	5.80	5.68	5.64	5.50	5.64	5.61	5.61	5.70	5.82	5.77	5.72	5.67	5.40	5.59	5.51	5.64	5.84	5.70	M	5.54	4.96
4	5.58	5.68	5.70	5.85	5.76	5.68	5.80	5.87	5.86	5.85	5.89	5.73	5.74	5.58	5.55	5.70	5.78	5.34	5.27	5.78	5.79	5.80	5.77	5.81
5	5.86	5.88	5.87	5.93	5.89	5.68	5.79	5.92	5.91	5.96	5.92	6.01	6.00	6.02	6.06	6.01	5.97	6.02	5.95	5.97	5.95	5.92	5.77	5.96
6	6.03	5.98	6.01	6.01	6.01	6.01	5.83	5.31	5.98	6.04	5.95	6.02	6.06	6.07	6.08	5.98	6.03	5.93	6.01	6.08	6.28	6.07	6.10	6.00
7	6.06	6.05	5.91	6.08	6.08	5.97	6.01	6.05	6.09	6.07	6.12	6.13	6.14	6.11	6.13	M	6.13	6.06	6.09	6.10	6.10	6.07	6.09	6.05
8	5.89	5.91	5.98	5.92	5.96	5.94	5.94	5.98	5.99	5.96	5.90	5.86	5.87	5.89	5.80	5.94	5.80	5.71	5.83	5.89	M	M	M	5.86
9	5.87	5.76	5.66	5.63	5.75	5.81	5.85	5.84	5.84	5.47	5.35	5.45	M	M	M	M	M	M	M	M	M	M	M	5.68
10	5.72	5.75	5.76	5.79	5.79	5.79	5.79	5.78	5.76	5.79	5.80	5.82	5.88	5.91	5.83	5.91	5.91	5.86	5.89	5.88	5.87	5.86	5.90	M
11	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	5.95
12	5.91	5.92	5.85	5.75	5.94	5.93	5.95	6.00	5.96	5.95	5.51	5.76	5.91	5.90	6.03	5.94	M	5.97	5.98	5.95	5.95	6.01	5.95	5.96
13	5.90	5.91	5.95	5.83	5.84	5.97	5.92	5.92	5.92	5.86	5.93	5.89	5.83	5.84	5.84	5.81	5.62	5.72	5.74	5.73	5.74	5.81	5.82	5.80
14	5.74	5.78	5.80	5.75	5.73	5.77	5.76	5.75	5.81	5.68	5.70	5.77	5.74	5.70	M	5.71	5.60	5.59	5.74	M	5.79	5.79	5.76	5.76
15	5.72	5.74	5.73	5.72	5.73	5.73	5.73	5.66	5.65	5.72	5.73	5.74	5.63	5.74	M	5.63	5.68	5.70	5.67	5.58	5.65	5.64	5.64	5.50
16	5.58	5.68	5.67	5.66	5.69	5.73	5.77	M	M	M	M	5.50	5.70	5.79	5.80	5.68	5.68	M	5.72	5.66	5.74	5.78	5.77	5.64
17	5.86	5.90	5.80	5.80	5.87	5.89	5.85	5.86	5.77	5.87	5.74	5.66	5.81	5.87	5.84	5.75	5.79	M	5.69	5.92	5.88	5.84	M	5.60
18	5.87	5.86	5.82	5.59	5.83	5.66	5.76	5.92	6.00	5.91	5.88	M	5.93	6.00	5.84	M	M	M	5.97	5.98	6.04	5.94	M	5.97
19	5.66	5.21	5.66	M	5.96	5.99	5.89	5.91	5.93	6.01	5.88	5.87	M	5.83	5.81	M	5.90	5.96	5.91	5.93	5.97	6.03	6.04	*-1.
20	6.03	6.03	6.05	5.98	6.08	6.04	6.05	6.05	6.07	5.97	M	6.14	6.10	6.06	6.08	M	6.14	6.18	M	6.16	6.12	6.15	6.11	*-1.
21	6.14	6.13	6.16	6.11	6.15	6.16	6.24	6.18	6.12	6.13	M	6.15	6.20	6.14	6.16	6.44	6.22	6.18	6.12	6.04	6.05	5.99	6.01	6.10
22	6.01	5.99	6.02	5.93	6.14	6.09	5.89	6.04	5.88	6.02	5.92	5.93	5.92	M	M	6.06	6.10	6.03	M	5.87	5.51	5.65	5.83	5.88
23	5.70	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	6.17
24	6.11	6.07	6.05	6.01	6.11	6.11	5.99	5.94	5.96	6.02	M	6.05	6.13	M	6.20	6.20	6.20	6.27	6.29	6.20	6.34	6.34	6.32	*-1.
25	6.41	6.44	6.48	6.42	6.38	6.39	6.46	M	6.48	6.44	6.53	6.58	6.59	M	6.47	6.47	M	6.49	6.48	6.47	6.54	6.68	6.57	6.55
26	6.57	6.55	6.66	6.61	6.31	6.30	6.42	M	6.42	6.53	6.59	6.47	6.59	6.56	6.52	6.63	M	6.69	6.63	6.70	6.70	6.67	6.63	6.58
27	6.36	6.55	6.36	6.42	6.55	M	6.49	6.45	6.46	6.52	M	6.52	6.62	6.47	6.38	6.52	M	6.49	6.57	M	6.46	6.10	6.05	6.32
28	6.47	6.41	6.42	6.37	6.38	M	6.41	6.44	M	6.45	M	6.40	6.32	6.42	6.56	6.41	6.45	6.41	6.39	M	6.38	6.42	6.36	6.36
29	6.39	6.26	6.29	6.27	6.31	M	6.07	6.28	M	6.31	6.28	6.21	6.30	6.26	M	6.18	6.11	6.06	6.06	M	5.85	5.88	M	5.76
30	5.91	5.94	5.84	M	5.72	5.88	5.84	5.80	M	5.81	5.82	M	5.58	5.50	5.46	5.29	5.31	M	5.32	5.34	5.37	5.61	M	5.66
31	5.61	5.61	5.31	M	5.37	5.47	5.41	5.55	M	5.49	5.54	5.23	5.49	5.37	5.54	5.61	5.63	M	5.58	5.76	5.76	5.59	5.57	5.44

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.
Earlier data available from WDC-A for Solar-Terrestrial Physics cover the period July 1975 - August 1976.

COLUMBIA OSO-8 GRAPHITE CRYSTAL SPECTROMETER DATA
X-RAY EMISSION LINE FLUXES

JUNE 1977

Si XV (5.09Å) Hourly Averages (-Log (flux), ergs/cm² s)

DAY/HR	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	5.48	5.53	5.37	5.55	5.45	5.52	M	5.15	5.64	5.64	5.47	M	5.61	5.83	5.83	M	5.80	5.90	5.61	5.84	4.83	5.83	5.33	*-1.
2	5.44	5.59	5.32	5.54	5.56	5.48	M	5.21	5.10	M	5.58	M	5.08	5.24	5.15	5.05	5.21	M	5.21	5.84	5.11	4.94	4.79	*-1.
3	4.72	4.66	4.63	4.87	5.04	4.70	M	4.94	4.98	M	4.69	5.21	5.20	4.84	5.11	5.06	4.93	4.61	4.91	4.98	5.05	4.90	M	5.27
4	5.17	5.20	5.16	5.24	5.30	5.06	5.06	5.28	5.03	4.92	4.96	5.20	4.48	4.99	5.13	5.10	5.29	5.22	4.95	5.40	4.91	5.24	M	5.51
5	5.30	5.39	5.00	5.53	5.56	5.41	5.61	5.44	5.53	5.42	5.49	5.47	5.52	5.62	5.49	5.54	5.51	5.60	5.62	5.60	5.74	5.37	M	5.79
6	5.56	5.79	5.74	5.27	5.53	5.66	5.53	M	5.71	5.17	5.35	5.70	5.63	5.72	M	5.78	5.61	5.68	5.71	5.81	5.25	5.53	5.61	M
7	5.62	5.72	5.63	5.37	5.76	5.84	5.66	M	5.72	5.71	5.82	5.80	5.94	5.70	5.66	5.64	5.72	5.76	5.78	5.33	5.46	5.50	AI	5.22
8	5.41	5.51	5.51	5.55	5.57	5.57	5.65	5.61	5.57	5.74	5.81	5.51	5.69	5.73	5.70	5.56	5.58	5.74	5.83	5.72	5.73	5.69	5.78	M
9	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
10	5.82	5.93	5.92	5.90	5.72	5.75	5.90	5.87	5.68	5.54	5.84	5.88	5.99	5.83	5.77	5.93	5.86	5.37	5.90	5.94	5.82	5.84	5.70	5.33
11	5.58	5.82	5.95	5.95	5.92	5.97	5.76	5.87	5.92	5.86	5.94	5.93	5.95	5.96	5.91	5.92	5.99	5.72	5.94	5.95	5.57	5.70	5.73	A
12	5.98	6.02	5.96	5.85	5.92	5.88	5.50	5.82	5.72	5.44	6.08	6.06	5.93	6.10	6.09	5.82	6.12	6.14	6.12	6.17	6.21	6.36	6.39	*-1.
13	6.30	6.36	6.39	6.41	6.14	4.86	5.19	5.76	5.89	6.03	6.23	6.19	6.27	6.33	6.31	6.09	6.15	6.21	6.03	5.84	6.15	6.13	6.23	6.40
14	6.26	6.13	5.96	5.60	5.92	6.37	6.40	6.37	6.43	6.38	6.38	6.41	6.28	5.97	6.12	5.99	6.18	6.19	6.27	6.44	6.49	6.43	6.50	6.64
15	6.50	6.41	6.37	6.28	6.29	6.40	6.32	6.20	6.10	6.19	6.33	6.06	6.10	6.15	6.10	6.08	5.71	5.67	6.16	6.34	6.49	6.31	6.36	6.24
16	6.43	6.29	6.04	6.00	6.09	5.80	6.14	6.14	5.88	6.10	6.25	6.27	5.65	5.94	5.91	5.97	5.87	5.94	6.04	6.25	5.97	5.89	5.84	*-1.
17	6.11	6.00	6.19	6.30	6.23	5.68	5.76	5.73	5.96	5.93	5.85	M	M	6.07	6.16	6.14	6.01	6.12	6.07	6.24	6.18	6.06	M	5.54
18	5.88	5.99	6.04	6.02	6.12	5.92	5.76	5.96	5.97	5.96	5.83	M	6.10	6.04	6.02	6.00	5.84	5.99	5.94	6.05	5.94	M	M	M
19	6.07	5.84	5.98	5.86	5.87	5.93	6.01	6.08	M	6.08	M	5.54	6.12	5.92	5.74	6.01	5.98	5.85	M	5.98	5.63	5.84	M	M
20	5.47	5.41	5.36	5.51	5.66	5.88	6.03	5.90	5.90	5.96	5.75	5.83	5.91	5.73	5.75	5.82	5.95	6.01	6.05	5.92	6.13	5.82	6.00	M
21	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	5.50
22	5.51	5.71	5.76	5.64	5.65	5.70	5.64	5.39	5.41	5.25	M	5.36	5.59	5.57	5.39	4.76	4.69	5.09	M	5.27	5.24	5.11	5.30	M
23	M	5.22	M	M	5.37	5.53	5.44	5.50	5.37	5.48	5.23	4.76	M	M	5.27	M	M	5.44	M	M	5.37	5.25	5.09	4.94
24	*-1.	4.49	4.92	5.02	4.93	M	4.55	4.56	M	M	4.09	4.13	4.37	M	4.44	4.82	M	5.00	4.52	4.54	5.06	4.99	4.99	M
25	M	4.96	4.71	4.84	4.82	4.90	4.95	4.93	4.91	4.81	4.76	4.60	4.89	4.88	4.90	M	M	4.98	M	M	4.75	M	4.62	4.55
26	M	M	M	M	4.39	M	M	4.52	M	M	M	M	M	M	M	M	4.32	4.41	4.80	M	4.68	M	4.60	4.84
27	M	4.95	M	M	4.61	M	M	4.73	4.97	5.02	4.72	M	4.92	4.97	M	4.92	5.12	5.27	5.11	M	5.20	4.91	4.32	5.06
28	5.00	5.17	5.18	M	4.39	4.97	5.21	5.20	5.14	5.11	5.43	5.51	5.55	5.48	M	5.44	5.56	5.40	4.64	5.37	5.28	5.37	5.40	5.33
29	4.96	5.07	5.00	4.90	5.12	4.66	4.59	4.92	5.11	5.21	4.96	5.33	5.39	5.30	M	5.53	5.55	M	5.52	5.46	5.49	5.17	M	5.13
30	5.44	5.46	5.42	5.39	5.34	5.63	5.73	5.65	5.54	5.53	5.62	5.60	5.43	5.60	M	5.56	5.64	M	5.61	5.72	5.60	5.71	5.82	5.77

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.
Earlier data available from WDC-A for Solar-Terrestrial Physics cover the period July 1975 - August 1976.

COLUMBIA OSO-8 GRAPHITE CRYSTAL SPECTROMETER DATA
X-RAY EMISSION LINE FLUXES
JUNE 1977

Si XIII (5.68A) Hourly Averages (-Log (flux), ergs/cm^{2}s)

DAY/HR	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	5.88	5.91	5.77	6.04	5.80	5.87	M	5.51	6.60	6.29	5.91	M	6.02	6.23	6.36	M	6.23	7.46	6.01	5.41	5.25	5.39	5.67	*-1.
2	5.91	6.11	5.69	6.02	5.94	5.90	M	5.62	5.55	M	6.10	M	5.41	5.66	5.66	5.50	5.70	M	5.65	5.49	5.55	5.33	5.17	*-1.
3	5.17	5.10	5.04	5.27	5.47	5.11	M	5.33	5.36	M	5.04	5.52	5.59	5.25	5.53	5.46	5.34	4.97	5.26	5.21	5.36	5.22	M	5.61
4	5.56	5.64	5.52	5.62	5.81	5.40	5.37	5.72	5.33	5.28	5.29	5.63	4.91	5.36	5.54	5.47	5.69	5.54	5.31	5.74	5.61	5.56	M	5.88
5	5.66	5.78	5.32	5.86	5.91	5.80	6.04	5.71	5.83	5.87	5.81	5.79	5.84	6.01	5.82	5.82	5.83	5.90	5.93	5.92	6.09	5.65	M	6.29
6	5.86	6.26	6.18	5.63	5.85	5.97	5.85	M	6.37	5.56	5.72	6.04	5.88	6.21	M	6.08	5.95	6.04	6.09	5.31	5.62	5.94	5.97	M
7	5.98	6.01	5.95	5.66	6.00	6.20	5.99	M	6.02	6.06	6.17	6.21	6.45	6.11	6.09	6.28	6.18	6.08	6.16	5.66	5.81	5.90	AO	5.61
8	5.79	5.95	5.79	5.90	5.94	5.88	6.09	5.89	5.95	6.05	6.26	5.80	6.07	6.08	6.02	5.91	5.87	6.06	6.23	6.11	6.06	6.05	6.06	M
9	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
10	6.28	6.25	6.25	6.34	6.09	6.05	6.31	6.17	6.14	5.97	6.24	6.21	6.32	6.37	6.19	6.38	6.28	5.68	6.25	6.35	6.27	6.14	6.07	5.61
11	5.91	6.22	6.34	6.35	6.39	6.39	5.98	6.21	6.37	6.18	6.29	6.32	6.30	6.25	6.19	6.27	6.57	6.00	6.36	6.20	5.88	6.01	6.14	A
12	6.11	6.37	6.36	6.26	6.24	6.23	6.00	6.25	6.07	5.85	6.46	6.44	6.27	6.59	6.42	6.17	6.47	6.54	6.45	6.63	6.63	6.97	7.15	*-1.
13	6.83	6.76	7.15	6.98	6.48	5.24	5.61	6.16	6.45	6.60	6.84	6.75	7.91	7.41	7.07	6.53	6.59	6.99	6.39	6.32	7.01	6.64	6.86	6.88
14	6.92	6.66	6.43	6.13	6.40	7.05	6.89	6.94	6.97	7.03	6.83	6.52	6.92	6.44	6.52	6.51	6.98	7.01	6.69	6.81	7.30	7.00	7.08	7.13
15	6.89	6.72	6.97	6.66	6.69	6.77	6.85	6.61	6.53	6.59	6.65	6.43	6.59	6.51	6.76	6.47	6.27	6.09	6.46	6.74	6.92	6.87	7.50	6.60
16	6.82	6.57	6.45	6.38	6.49	6.17	6.32	6.52	6.27	6.68	6.61	6.46	6.03	6.31	6.18	6.40	6.17	6.23	6.43	6.59	6.38	6.29	6.27	*-1.
17	6.42	6.40	6.48	6.74	6.35	5.94	6.07	6.15	6.24	6.29	6.08	M	M	7.53	6.47	6.63	6.26	6.65	6.64	6.57	6.18	6.41	M	5.77
18	6.21	6.31	6.33	6.42	6.21	6.24	6.14	6.24	6.12	6.31	6.21	M	6.46	6.18	6.66	6.87	6.85	6.27	6.27	6.41	M	M	M	M
19	7.70	M	5.91	5.70	5.75	6.10	6.03	5.76	M	5.89	M	5.10	7.02	6.25	5.96	6.81	6.24	6.29	M	6.25	5.94	6.28	M	M
20	5.83	5.67	5.73	5.82	6.02	6.11	6.41	6.12	6.17	6.26	6.01	6.13	6.24	6.02	5.98	6.15	6.30	6.19	6.35	6.27	6.43	6.10	6.30	M
21	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	5.83
22	5.87	6.10	6.09	6.18	6.05	6.06	6.05	5.77	5.68	5.56	M	5.69	6.00	6.09	5.82	5.07	5.00	5.47	M	5.66	5.70	5.58	5.74	M
23	M	5.67	M	M	5.79	5.91	5.82	5.95	5.71	5.87	5.54	5.17	M	M	5.76	M	M	5.83	M	M	5.80	5.68	5.51	5.38
24	*-1.	4.90	5.37	5.43	5.36	M	4.95	4.95	M	M	4.48	4.52	4.78	M	4.90	5.23	M	5.45	5.83	5.05	5.56	5.51	5.46	M
25	M	5.40	5.18	5.29	5.32	5.37	5.44	5.44	5.40	5.28	5.22	5.83	5.36	5.37	5.36	M	M	5.49	M	M	5.26	M	5.15	5.13
26	M	M	M	M	4.85	M	M	5.07	M	M	M	M	M	M	M	M	4.82	4.85	5.28	M	5.21	M	5.07	5.31
27	M	5.36	M	M	5.02	M	M	5.17	5.39	5.45	5.14	M	5.35	5.38	M	5.31	5.59	5.74	5.57	M	5.65	5.29	4.74	5.43
28	5.32	5.55	5.58	M	4.72	5.34	5.63	5.59	5.47	5.44	5.82	5.98	5.97	5.87	M	5.79	5.96	5.81	4.94	5.75	5.66	5.74	5.75	5.69
29	5.31	5.44	5.31	5.22	5.44	4.99	4.94	5.27	5.46	5.57	5.39	5.74	5.79	5.67	M	5.95	5.91	M	5.93	5.82	5.85	5.54	M	5.51
30	5.85	5.95	5.85	5.74	5.80	6.04	6.29	6.06	5.98	5.92	6.04	6.04	5.94	5.99	M	5.87	6.08	M	6.08	6.21	6.00	6.15	6.31	6.14

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.
Earlier data available from WDC-A for Solar-Terrestrial Physics cover the period July 1975 - August 1976.

COLUMBIA OSO-8 GRAPHITE CRYSTAL SPECTROMETER DATA
X-RAY EMISSION LINE FLUXES
JUNE 1977

Si XII (5.82Å) Hourly Averages (-Log (flux), ergs/cm^2 s)

DAY/HR	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	5.54	5.53	5.44	5.60	5.57	5.61	M	5.38	5.75	5.69	5.59	M	5.72	5.78	5.83	M	5.80	5.89	5.67	5.41	5.22	5.31	5.48	*-1.
2	5.55	5.61	5.54	5.64	5.63	5.60	M	5.49	5.37	M	5.58	M	5.45	5.48	5.39	5.44	5.41	M	5.44	5.31	5.37	5.24	5.13	*-1.
3	5.07	5.05	5.04	5.15	5.23	5.05	M	5.19	5.27	M	5.01	5.38	5.38	5.31	5.37	5.29	5.27	5.04	5.19	5.19	5.25	5.23	M	5.42
4	5.37	5.32	5.33	5.36	5.44	5.29	5.29	5.40	5.34	5.27	5.22	5.33	5.02	5.22	5.27	5.26	5.33	5.31	5.21	5.39	5.23	5.37	M	5.49
5	5.44	5.44	5.27	5.49	5.52	5.44	5.58	5.49	5.48	5.45	5.49	5.45	5.54	5.56	5.52	5.48	5.53	5.51	5.57	5.59	5.65	5.48	M	5.68
6	5.60	5.67	5.67	5.44	5.55	5.57	5.59	M	5.65	5.37	5.44	5.56	5.62	5.71	M	5.63	5.60	5.62	5.64	5.28	5.38	5.49	5.59	M
7	5.59	5.63	5.58	5.51	5.69	5.74	5.63	M	5.62	5.51	5.66	5.64	5.63	5.64	5.61	5.64	5.66	5.61	5.64	5.46	5.46	5.49	AQ	5.39
8	5.46	5.52	5.53	5.54	5.55	5.54	5.57	5.60	5.55	5.65	5.67	5.55	5.64	5.64	5.60	5.58	5.57	5.63	5.72	5.66	5.61	5.59	5.61	M
9	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M
10	5.77	5.78	5.80	5.75	5.70	5.72	5.77	5.74	5.70	5.63	5.72	5.79	5.78	5.73	5.74	5.74	5.79	5.55	5.77	5.82	5.78	5.82	5.76	5.49
11	5.62	5.71	5.79	5.83	5.80	5.82	5.78	5.77	5.82	5.78	5.85	5.85	5.82	5.82	5.81	5.80	5.86	5.73	5.90	5.80	5.69	5.73	5.74	A
12	5.78	5.84	5.86	5.82	5.82	5.80	5.64	5.83	5.80	5.62	5.94	5.90	5.87	5.96	5.95	5.88	6.02	6.04	6.03	6.01	6.06	6.22	6.15	*-1.
13	6.19	6.18	6.20	6.20	6.16	5.29	5.52	5.85	6.00	5.98	6.03	6.10	6.09	6.13	6.11	6.13	6.09	6.11	6.10	6.02	6.09	6.07	6.08	6.20
14	6.13	6.15	6.07	5.92	6.00	6.23	6.26	6.24	6.24	6.26	6.31	6.22	6.21	6.07	6.13	6.07	6.15	6.13	6.20	6.31	6.31	6.35	6.43	6.39
15	6.32	6.31	6.31	6.28	6.23	6.34	6.27	6.27	6.30	6.28	6.30	6.13	6.16	6.22	6.18	6.15	5.97	5.89	6.19	6.19	6.34	6.24	6.18	6.17
16	6.29	6.23	6.19	6.10	6.10	5.99	6.18	6.14	5.96	6.14	6.20	6.19	5.94	6.02	5.96	6.08	5.96	5.99	6.10	6.02	6.00	5.99	6.03	*-1.
17	6.01	5.99	6.09	6.14	6.06	5.79	5.91	5.82	5.92	5.87	5.82	M	M	5.94	6.11	5.99	5.94	6.09	6.17	6.13	5.91	5.95	M	5.90
18	5.87	5.84	6.02	6.00	5.91	5.88	5.82	5.97	5.86	5.89	5.95	M	6.03	5.99	5.70	5.87	5.71	6.03	5.68	5.67	5.84	M	M	M
19	5.92	5.70	5.56	5.10	5.05	5.25	5.60	M	M	7.84	M	5.54	5.45	5.64	5.74	5.87	5.86	5.76	M	5.87	5.69	5.76	M	M
20	5.58	5.61	5.48	5.62	5.74	5.83	5.93	5.95	5.85	5.89	5.79	5.80	5.75	5.82	5.84	5.82	5.88	5.92	5.95	5.84	6.00	5.91	5.92	M
21	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	M	5.60
22	5.57	5.68	5.70	5.63	5.63	5.64	5.65	5.51	5.57	5.42	M	5.45	5.59	5.58	5.50	5.15	5.08	5.26	M	5.43	5.43	5.40	5.44	M
23	M	5.41	M	M	5.49	5.54	5.48	5.51	5.47	5.50	5.48	5.24	M	M	5.40	M	M	5.53	M	M	5.47	5.49	5.39	5.26
24	*-1.	4.95	5.23	5.29	5.21	M	5.05	5.05	M	M	4.50	4.56	4.76	M	4.89	5.11	M	5.26	5.01	5.05	5.31	5.28	5.24	M
25	M	5.24	5.14	5.21	5.24	5.21	5.26	5.28	5.24	5.14	5.13	4.99	5.23	5.24	5.22	M	M	5.27	M	M	5.16	M	5.07	5.08
26	M	M	M	M	4.74	M	M	4.98	M	M	M	M	M	M	M	M	4.81	4.88	5.11	M	5.09	M	5.04	5.16
27	M	5.24	M	M	5.09	M	M	5.07	5.21	5.24	5.14	M	5.23	5.25	M	5.18	5.28	5.36	M	5.39	5.31	4.93	5.29
28	5.28	5.39	5.41	M	4.89	5.30	5.30	5.43	5.39	5.40	5.47	5.51	5.56	5.55	M	5.51	5.60	5.51	5.08	5.46	5.46	5.47	5.50	5.46
29	5.19	5.27	5.21	5.14	5.26	5.10	4.93	5.16	5.26	5.31	5.22	5.42	5.45	5.39	M	5.53	5.56	M	5.57	5.54	5.54	5.46	M	5.33
30	5.55	5.52	5.54	5.49	5.49	5.59	5.70	5.63	5.59	5.62	5.61	5.60	5.58	5.62	M	5.65	5.64	M	5.66	5.63	5.60	5.65	5.74	5.69

Note: "B" indicates the flux was below the cut-off levels.
"M" denotes periods of missing data.
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